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NEWS IN BRIEF

Intel services
division sold

UNITED Computing Systems of Kansas City, parent company of London United Computing Services and Atkins On-Line, has taken over the Utility Division of the selling Intel's Data Services Group. Machines acquired by United include a Control Data Cyber 170 at Dallas and an Univac 1100/81 in Chicago. They should be made available to terminal users in the UK via United's Uninet.

Phone link

USERS of multiple IBM 3750 and 1750 telephone switching systems can now link them together in a private leased line network using a new facility, Integrated Networking System. This allows operator facilities to be concentrated at one site and for users to get the same call transfer, paging, and other services throughout the network rather than just at their home site.

IBM for Manchester

DESPITE political pressure to buy an ICL system Greater Manchester Council has confirmed its decision to replace its IBM 300/60 with two IBM 4331s. The pressure came from a group of MPs, led by Labour's Gerald Kaufman, who deplored the decision on the grounds that ICL had a big stake in Manchester with its factories.

Wiring link

UP to 255 devices can be linked via the electrical mains wiring in a building to a central controller using the Interphaser system from Modular Technology of Watford. Interfaces are available for audio and data communication.

**Going...
Going...**

COMPUTER WEEKLY

Homes and offices for disabled scientists

TECHNOLOGY graduates who have previously been unable to work in their chosen careers because of severe disabilities may now have the chance to take part in a scheme set up by the Nuffield Foundation grant and administered by the staff of Cranfield Institute of Technology's fluid engineering unit. Homes and offices for disabled are being

provided for 12 academically qualified people at the Spado Society's professional workshop in Milton Keynes and four of these places have been allocated to the Cranfield scheme. The people involved are likely to have an engineering background and the desire to use the computer as a major tool in their work. The

scheme has been set up by Professor Roger Baker, head of the fluid engineering unit at Cranfield, and a Nuffield grant of £48,000 has been allocated to the plan. Baker said, "Participants should be of graduate level though disability may have prevented them from taking their final examinations."

GEC joins
in battle
for Decca

A TOUGH battle for control of Decca is under way following GEC's bid of £82.5 million in cash for the company. This counters Racal's all-paper offer of about £88 million, depending on movements in the Racal share price.

Since GEC has some £800 million in cash reserves, whereas Racal would be somewhat stretched to include any substantial cash element in a new bid, the first round goes to GEC. But there is one cloud on GEC's horizon.

"There is a fairly strong possibility of a reference to the Monopolies Commission," Graham Meek, electronics industry analyst with stockbrokers Wm Mackenzie, told Computer Weekly. "I don't think it likely that the Racal bid will be referred, but GEC-Marconi and Decca do overlap in the electronic warfare area."

"One view I've heard expressed is that if GEC wins Decca, it will bring a Racal bid for Ferranti closer. I don't think that is likely because Ferranti wants to stay independent for the time being."

He pointed out that it was unusual for GEC to come with a counter-bid for a company already under offer, noting that the last time was with English Electric in 1968.

DP clash as
firms merge

TWO building societies, the Midshire based in Wolverhampton and the Town and Country based in Clifton, Essex, have reached preliminary agreement on a merger which would make the joint society 18th biggest in the country.

No discussions have yet been held about the computer departments, but there is little compatibility: the Midshires has a Honeywell Level 84/30, and is installing Philips PTE 8000 counter terminals in 35 of its 80 branches, while the Town and Country has an NCR Criterion 5570 and NCR 796-301 booth-office VDUs in its branches.

The Midshires' branches are concentrated in the Midlands, while the Town and Country has its 80 or so branches scattered over the UK.

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Briefing

Racal set for
new Decca bid

RACAL's counter bid to the £82.5 million offer from GEC for Decca was still awaited as Computer Weekly went to press. Racal chairman Ernest Harrison and his board had long sessions with their bankers Hill Samuel to decide what action to take. It was expected that Racal would put up about £100 million based on a convertible loan stock issue.

If Racal wins the battle for Decca its next major decision is likely to be whether to bid for the NEB's 50% shareholding in Ferranti, which will be on offer later this year. Harrison has said he would like to buy a large part of that operation (CW, June 7, 1979). GEC would make no comment about any interest it might have in Ferranti.

IBM's new machine

IBM is preparing to introduce a third 4300 series machine next week. A more powerful machine than the existing 4341, it will probably be designated the 4351 and will match the existing 4301 in performance while costing \$400,000. It will effectively supersede the 4301.

PO profits hit

POST Office Telecommunications' profits for the half year to last September fell to £90m from £144.7m in the previous half year, mainly because of the delay to telephone billing caused by the computer staffs industrial action in support of a pay claim (CW, August 30, 1979). Overall the Post Office's profits fell from £170.2m to £49m.

Hitachi plant

HITACHI is to build a factory in Landshut, West Germany, which will have an initial production capacity of 300,000 devices a month. Hitachi joins NEC, which has a plant in Elre, and Fujitsu, which is also planning a European factory.

Nixdorf extends

NIXDORF has extended its 8800 line of terminal systems with a remote computing system, seen in Germany as a competitor for IBM's 8100. Called the 8884, it joins Nixdorf's existing 8884 series of banking terminal products and 8802 point-of-sale systems. The 8880 is a programmable in Cobol and supports downloading of programs from a mainframe. The product is not yet offered in the UK.

Gray leaps ahead

GRAY Research has announced turnover and net profit figures for 1978 which are dramatically better than 1978. The supercomputer manufacturer's turnover jumped 140% to nearly \$43 million while net profits leapt from \$2.1 million to \$7.8 million. At \$4.3 million turnover in the fourth quarter was four times better than in the same period a year before.

A full company news page 18

COMPUTER WEEKLY

Number 693

Thursday, February 14, 1980

Price 20p



Hooper

Hooper takes over at Prestel

THE Post Office is to set up a new business systems department with Dr Alex Reid as director. Dr Reid comes from Prestel, for which he will continue to have an overall responsibility. He will be replaced as director of Prestel by Richard Hooper, currently managing director of Mills and Allen Communications, a major information provider organisation for Prestel.

Hooper joins the Post Office on March 1 and will be responsible for the

big push of Prestel, which will begin at the Viewdata 80 exhibition and conference next month, and for the Prestel International trial being run with systems house Logica in several countries including Switzerland, Australia and the US.

His previous experience includes producing educational broadcasts at the BBC and heading for five years the government-sponsored National Development Programme in Computer

Assisted Learning.

April 1 will see the start of the new business systems department. Set up as part of the reorganisation of the telecommunications business begun last autumn, it will operate under the telecommunications marketing executive and as well as Prestel it will cover the marketing of System X and the Post Office's new generation of telephones in the business community.

Pay strike threat to
NCR users

NCR sites all over the country will be hit by a service engineers' strike on February 18 and 19 unless NCR comes up with a satisfactory pay offer before then. Selective strikes at selected major sites will start on February 22 if the dispute is still not settled.

The 750 engineers involved in the dispute all belong to the Association of Scientific Technical and Managerial Staffs and represent 80% of NCR's total field service workforce, according to ASTMS.

ASTMS divisional officer Jim Mercer told Computer Weekly that NCR's current offer of 18% was considered by the union to be sufficient to cover the 1980 rise in the resale price index but not enough to provide the service engineers with a real share in the prosperity of the company.

NCR was regarded by the union as very profitable. ASTMS originally asked NCR

for 30% but no specific figure is now being demanded.

The engineers service a wide range of NCR equipment from point of sale terminals to large scale systems. The selective strikes from February 22, if they come off, could affect big sites like Hertfordshire County Council and the Clydesdale Bank in Glasgow.

Without naming specific sites Mercer remarked: "We will take the biggest."

An NCR spokesman said that the company wished to make no comment on the dispute at this stage.

Government prepares
micro education plans

THE government's plans for promoting microelectronics education in schools will be announced in the next few weeks, Dr Rhodes Boyson, Education Under-Secretary, told the Commons. Some fear that the programme will be much watered down from that put forward (but never implemented) by the Labour government (CW, March 15, 1979), but the essential elements will probably be there.

The Labour proposal involved funding of £12 million over five years and the establishment of a central agency to oversee the programme. Because of the present government's spending

cutbacks the financial backing is likely to be less. However, Dr Boyson mentioned three specific areas the new programme would cover: curriculum development, teacher training and the development and standardisation of software.

Commenting on this, Geoffrey Hubbard, director of the Council for Educational Technology, said that these areas were of central importance.

Teachers have been pressing for information on the plan, and the Department of Education has been caught between these pressures and the government's desire to cut back.

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Modern computing has so far had a very short life span but there seems to be continuing confusion as to who did what, and when, in those early days. Aiming to erase the errors and to get the facts on record, Donald Michie outlines the story of the first modern computers, the Colossus of Bletchley Park.	2
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US datacom
firm aims
to be top
UK supplier

GENERAL DataComm, which claims to be the largest US data communications equipment maker not owned by a telephone company, has launched a UK subsidiary with the aim of becoming the No 1 supplier in the UK.

GDC has agents in most European countries and its products were previously sold in the UK by International Aeradio, which also uses them in its networking systems. The companies say they will not be rivals although they sell similar products. GDC says International Aeradio will enjoy better support from a larger local stockholder.

The UK subsidiary is setting up offices and workshops in Wokingham, Berks, to support the sales and service functions initially followed by applications engineering, and plans to add development engineering by the end of the year.

The subsidiary is setting up under a US managing director, Jim Linnell, initially, but plans to hand over to UK management later.

Two UK directors have been appointed, Paul Carter, marketing director, and Bob Jones, technical director. Carter comes from Racal after 17 years, which took him from apprentice to marketing manager. Jones spent the last three years at Borer, before which he too was at Racal.

GDC aims to oust International Aeradio from second position. **Turn to back page**

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To see ourselves as others see us...

I DON'T know how often you read Vogue, but you may be interested in what this distinguished fashion magazine thinks of you. It has just printed an article giving all the lowdown on — guess what — microchips, including the following:

goes on to explain the buzz words with a glossary for the layman. Excerpts therefrom:

AI: Artificial Intelligence, ie machine intelligence. Proves sealed state of computer man's mind, he never thinks AI could stand for anything but Solid State having an iube, is an moving parts. A semi-conductor device.

Fetch: to go and bring back. Good dog computer.

Modelling: exciting new memory allowing computer to presuppose and predict the what if factor. With this planning ahead will be sensible reality.

Language: All computers programmed in one of two basic languages. Fortran or Basic.

The piece ends with the warning: Please remember that this is a very serious subject. I certainly shall, Ms Vogue.

Fact: The NER has two non-government funded schemes, INMOS and EXMOS, for new technology... Microchips are cheap because they can be made on mass without quality control... The chip does not go wrong and has great life expectancy....

Maybe these gems will cast some doubts in people's minds about the first crack. Let's hope so.

Vogue then thoughtfully

From the heart.....

YOU will have noticed from your bulging letter box that today is Valentine's Day. I'm sure the Russians will have diversified from Christmas cards into Valentines by now; had any of them? How about microprocessor-controlled cards?

I imagine I am joking, but doubtless there is someone in California who has produced a card that recites "Roses are red when you kiss it with passion above a specified threshold."

The Times, I feel, is seriously threatening its reputation as a serious newspaper by its gushing special offers of books of poems to promote its Valentine's Day adverts. Nobody

seems to be providing the same service for computers, so I shall have a go.

"Darling Met Office Gray: Are we compatible? Could we be charge-compelled devices? Yours ever, ULCC 7800."

I have an announcement from International Data Automation about a data entry system, and throughout it refers to its "V-24 communications channel."

Well, perfume is certainly for the purposes of communicating!

Quote from Tim Webb of white-collar union AUTMIS, who is on the Noddy Telecommunications sector working party: "The nice thing about having your phoned tapped is you know it's working."

GILB'S MYTHODOLOGY

Building up a software engineering handbook

IN my last column I introduced the Technique/Attribute table concept as a conventional means of storing technical know-how, but one which is as yet little exploited in the technological disciplines concerned with logware and dataware, the two most important forms of software.

I should listen to note that I have a private self-made collection of technique/attribute tables (in such areas as maintenance technology) which I will be happy to share with anyone interested in building up a handbook. They are very rough, but they are a start.

Others have attempted to use the principle, such as Barry Boehm of TRW for comparing five structured design techniques by 17 attributes on a four point scale (Infotech Software Reliability 1977), or TRW Systems Software Reliability Study (Thayer et al, North-Holland) which provides tables which detail the error-finding effectiveness of nine classes of technique against 20 error-classes using three-digit accuracy (eg, 24.0% probability that Design Inspection (a la Fagan) will catch a "user interface error", which presently accounts for 6.8% of maintenance changes in four military projects).

Capers Jones of IBM San Jose has made a technique/attribute table for 26 techniques as applied to three development classes — new, modification of old style programs, modification of modern (IPT, SP) programs, and further to five ranges of program size (small to super-large). Jones rates IBM experience ("based on interviews with 1,500 employees") with the techniques on a scale of four (great, moderate, low, unknown value), which is primitive, and

not well defined, but much better than most, and it is a start (IBM TR 02.764, 1977).

There is, to my knowledge, only one example of something more than this, something closer to a complete handbook. This is Montgomery Plister Jr's Data Processing Technology and Economics (Box 3543, Santa Monica, CA, US) which in hundreds of pages of tables and graphs tries to collect hardware and software facts and figures in a readable, accessible form. When we realise that Plister's excellent example is the work of a single individual, we should be ashamed that our institutions have not accomplished more, yet.

Plister's handbook, however, does not contain much of the information that we software

engineers need at all. In particular it does not contain information relating to particular new programming and data design techniques. You cannot ask questions relating to the relative readability of decision table logic as opposed to, for example, a top-down decision tree structure. This is not Plister's fault, since our computer science academics have only recently begun to provide some of this type of research data, and the bulk of what we need to know now is not available in practice.

Of course Plister is ahead of his time. He has the right profile for the wrong people. Even if the perfect technique/attribute handbook were published right now, then less than one per cent of our current crop of computer professionals are trained or motivated to make use of such know-how.

If we are not specifically directed at early design stages to produce systems with clearly defined and measurable properties, then there is little reason to be grateful for a source of information leading us to the techniques necessary to achieve such systems.

In his New Year's Day speech on TV for 1980, the Norwegian



Tom Gilb is an independent consultant, lecturer and author on computing topics.

Prime Minister, Odvar Nordli, seemed concerned. "... We must provide ourselves the know-how and conscious direction for managing these new tools (computers). It is a question of forming an active partnership to direct the technological era, rather than being formed by the technology itself."

I presume that many other top political and industrial leaders are concerned with exactly these questions. I don't expect any revolution in our system specification and design habits. The handbook will not happen overnight. It is happening. The handbook has begun to exist.

It is the flood of new ideas, methods and techniques which pressure us to organise the know-how about them. It is the increasingly high quality requirements for new and sometimes life-critical systems which force us to seek new technological solutions with improved attributes. It is the competitive forces of the marketplace on policies which demand that we use the very best available know-how.

But, one day, some institution will recognise the opportunity and prestige that lies in making the internationally recognised software engineering handbook. Will it be a National Computing Centre? Will it be a professional computer society? Will it be a consulting firm? Will it be a publisher like McGraw Hill? Will it be a computer manufacturer? Or will it simply be a lone individual like Plister, who is flexible enough to move while the giants sleep.

In the meantime, each individual reader of this column can do as I have and individually collect know-how in more systematic notes. Hmm, I just thought of another use for my Apple II!

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PO takes major step on System X

THE first major step in preparing the telephone network for System X has been taken with the Post Office placing orders with STC and GEC Telecommunications for ten 140 megabit per second digital transmission systems worth £1.2 million.

Single chip for digital switching

TELECOMMUNICATIONS Radioelectricques et Telephoniques of Paris has licensed to Harris Semiconductor of Melbourne, Florida, the design of these new tools (computers). It is a question of forming an active partnership to direct the technological era, rather than being formed by the technology itself."

The SLIC is the latest element of digital switching telecommunication equipment to be reduced to a single integrated circuit component, since discrete transistors and hybrid solutions had previously been necessary to ensure overvoltage protection and to handle the ringing signal.

Harris does not expect to go into full production of the device until next year, but it claims it will still have a significant lead over competitors in a market which it thinks will be worth over \$100 million a year by 1984.

Closer links with Post Office aim

BETTER representation to the Post Office and the communications industry is the aim of the telecommunications managers division of the Institute of Administrative Management in changing its name to the Telecommunications Managers Association.

It will continue to have close links with the Institute and also aims to ensure that top management is kept informed of developments in communications technology.

The association has 300 members and in 1977 it was the only independent body to give evidence to the Carter Committee on the future of the Post Office. It has since helped telecommunications users in Belgium and Switzerland to set up groups, and initiated Intug, the International Telecommunications User Group.

MPs' forum
MEMBERS of Parliament will have a chance to hear the computer industry's views on education at the next meeting of the Parliamentary Computer Speakers' Bureau on February 26. Among the speakers will be Colin Tully of York University talking on Information Technology in the Universities, and Derek Roberts of GEC, on industry's needs.

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The systems are due to come into service in early 1982, covering 280 kilometres between Leeds, Sheffield, Wakefield, Barnsley, Huddersfield, Manchester and Chester, and between Chester and Liverpool.

The Post Office has agreed with the Telephone Equipment Manufacturers Association that no more orders for analogue

transmission plant will be placed after the end of financial 1983-84. From then, plant for growth and replacement will all be digital.

In the 1980s the UK became the first European country to use digital transmission and the network now has 7,000 24-channel pulse code modulation systems in service, and about 100 of the 30-channel systems.

IBM adds 20% to usage charge on 3800 printer

AMONG the comprehensive list of price increases announced by IBM last week are a big increase for the usage charge on the 3800 laser printer, and extension of the quantity discount structure for its media and supplies.

The maintenance charge and the usage charge for the 3800 both go up 20%, a move which Des Lee, chairman of the IBM Computer Users' Association, believes will put the company at risk from competing products such as the Xerox 8700 and the new laser printer expected imminently from Documentation.

The discount structure has been extended to supplies for the printer. Developer comes in cartons of two, previously priced at £262.50. The new price is £321 per carton, but for between 9 and 28 cartons, the unit price is below the old price at £254.80, and the biggest discount is for 29 or more, where the unit price falls to £248.

Toner comes in packs of six, previously costing £157.50, and now up to £269.41. A four-step discount structure now operates, but it is not until 98 or more are ordered that the unit price falls below the old price, to £150.

Floppy discs are also up in price, from £4.17 to £5.12 each. A discount structure already operated here; now the unit price is £3.17 for 500 or more, down 3p from the previous £3.20.

Daisywheel printer launch soon

A NEW daisywheel printer is believed to be on the way from IBM, and the company is expected to offer a more integrated set of communications facilities, from its General Systems Division to compete with the Data Processing Division's SNA products.

Having eadled its Office System 8 word processor with the expensive and trouble-prone 6640 ink-jet printer, IBM has since offered a daisywheel alternative, but had to acquire the mechanisms from Qume.

According to Dale Kutolek of the Yankee Group research organisation, the Office System 8 cost IBM a market-share because it was difficult to use, and had too small a screen. As a result, he estimates that by the end of 1978, only 13,000 System 8s had been shipped, with 6840 sales at a meagre 3,000.

Dutch factory

BASIC FOUR computers sold by MAI in Europe are to be built at a new plant just opened at Enschede in Holland. The plant cost £1 million and covers 3,300 square metres. MAI's European turnover in 1978 was \$72 million compared with \$44 million in 1976 and the company says that it is now selling 100 Basic Four computers a month in Europe.



Comart factory due for completion this month

WITH everything else that micro-computer distributor Comart has been involved in, what with buying the Byta Shop retail chain and signing an agency deal with CAP for Microcobot, its directors have still had time to get their feet

muddy. Managing director David Moss (left) and marketing director John Lamb are seen here outside Comart's new factory in St Neots which is expected to be completed by the end of this month. From here the company will be able to expand

the assembly of the Cromacore and North Star Horizon microcomputer systems it is agent for, which arrive in the UK in kit form, as well as its own computer line called Micro-box.

See also Micro News, page 12

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DECwriter IV Desk Top Terminal

Now desk-top microprocessor driven terminal, operating at 300 baud, printing at burst speeds up to 45 cps. Maps features include firmware selectable character sizes, horizontal and vertical spacing, tabulation and margins. The keyboard feels like a typewriter and the 9x7 matrix print head produces clear printing.



HYTERM Word Processing Terminals

New range of microprocessor controlled daisy-wheel terminals for word processing applications. Features include proportional spacing, justification, centring, bold printing, etc. plus all standard Hyterm features. Available for metal or plastic daisy wheels giving widest range of type fonts.



SILENT 700 Portable Terminals

Range of microprocessor controlled lightweight terminals featuring a field proven thermal printing technique giving silent printing at 30 cps. Options include built-in acoustic couplers and a non-volatile magnetic bubble memory capable of storing 20K to 50K characters. This feature allows full editing of data prior to transmission.



HI410/1420 VDU's Low Cost Video Terminals

Two new low cost VDUs featuring full 24x80 screen, and additional numeric keypad. Both include upper and lower case characters, alternate font, high-low intensity, blink or non-display, field and column tabulation, audible alarm.



PAGE SIX for programmers and analysts

by Judith Morris

Graduates told—Well, you can always go into DP

IT is no longer surprising to go into any industry and find people working there who have academic qualifications in subjects totally unrelated to the job they are doing.

Computing, being a comparatively new profession, has only recently become one of the careers offered to the graduate who cannot find employment in the field of his choice.

Over the past few years more students are leaving university to enter the computer business, and this is being encouraged increasingly by careers officers.

Educationalists now refer to computing as one of the "other" careers which, together with sales and marketing, can offer a

large number of openings to graduates from any discipline each year.

Computer programming, of course, holds little appeal for the average 21-year-old academic who has graduated in something like Music or History. In fact it is likely that, for most of his life, nothing has been further from his mind.

Unfortunately, the supply and demand of graduate jobs is often highly disparate and people with vocational qualifications are usually the ones who suffer severe culture shocks on leaving university.

When they are superbly versed in Medieval English or Sociology they are suddenly

faced with the traumatic experience of coming brusquely down to earth.

A report published by the Association of Graduate Careers Advisory Services, the Central Services Unit for careers and appointments services, and the Standing Conference of Employers of Graduates (SCOEG) says that 1980 promises to be quite a good year for graduates coming into the job market for the first time, with demand for degree holders up by four per cent over 1979.

But the supply of graduates in the arts, biological science and social studies is "greatly in excess of demand in terms of jobs relevant to their studies," says the report, "and such graduates must be prepared to be flexible in their choice of employer, type of work and location. The above trend has been apparent for some years, it is now causing an acute imbalance."

The big computer companies have been taking advantage of the trend for some time. Most of them take on a set number of graduates each year through a special scheme and then provide intensive training.

It is disturbing, however, to read in the report that advice given to graduates "who are not outstanding in either academic performance or personal qualities" is to apply "energy and imagination to the job search" and look at computer programming, purchasing, sales and retail areas where demand exceeds supply.

But how eager are these people to join the computer business and how successful are they once they get in? Do they resent the fact that they have

been forced perhaps into a career to which they do not feel totally akin?

The problem with graduates, as most employers will testify, is that although they have a proven record of intelligence and thinking power, they are also the sort of people who will not willingly take a job with which they have no empathy. The fact that they do so does not necessarily mean they will stay there if something better comes along.

Out of more than 100,000 graduates with first or higher degrees, about 53,000 will come fresh into the job market this year. Last year, ICL alone took on 450 graduates from a variety of disciplines and in the previous year began to recruit 18-year-olds as well, for the first time.

It is easy to see why. The drop-out rate of graduates is often much higher than with people who have chosen, at the age of 18, to opt for work rather than further education.

A typical group of 16 graduates who joined one of the major manufacturing companies after leaving university was reduced in 12 months to 12. All four left the company, after an expensive training scheme, to pursue careers in fields far removed from computers.

If a company like ICL takes on 450 graduates, and four out of 16 leave in the first year, that means a quarter of the firm's money and effort is wasted. It is all very well for careers officers nationwide to proclaim the benefits of applying for jobs in computing if you aren't much good at anything else. And, if it doesn't suit you, then you can always use the time to look round for something which

Programmers need high-level experience

THE debate over the importance of machine code goes on. This week we received a letter from David Rids, of Somersot who says, "I don't find it all surprising that no-one wants to apply for a job (Pogo Six, January 17). It's analogous to a person being skilled with a file applying for a job as a captain lath operator."

"It doesn't really matter whether he thinks Cobol is an apologetically bad language or not," he continues. "Hundreds, if not thousands, of installations use it extensively and for very good reasons, the main one being economic."

"I have seen figures quoted of about £5 as the cost of a single machine-language instruction with a productivity of about six instructions per day per programmer, as opposed to 100 instructions per day for high level languages. And one high level language instruction is equivalent to many in a machine language."

At the end of all this, of course, one ends up with a program which no-one else understands, and which is useless on any other computer than the one for which it was written.

So, if Chris Blackmore persists in wanting to be the only one in stop he shouldn't complain about the consequences," concludes Rids.

who, after being educated to a high level, often expects to be treated like an oracle the minute he joins the industry. Disillusionment can take quite a long time.

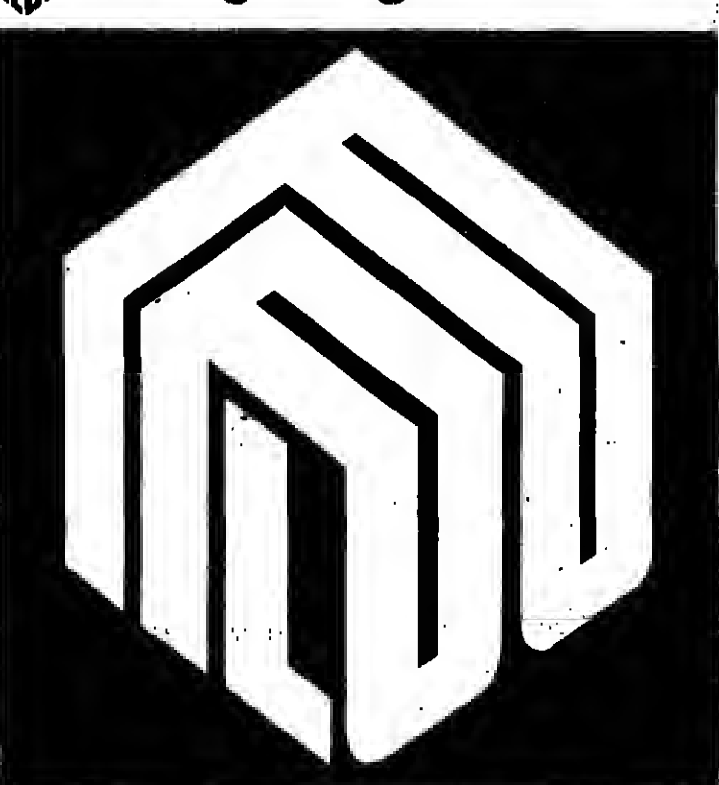
Companies have to ravel salaries every so often to remain competitive. Graduates looking for a first job are obviously going to consider salary as one of their main priorities.

What can often happen, however, is that a graduate who earns a reasonable salary on joining a firm, is still on more or less the same after a year or even more and, with competition getting stronger all the time, he can find himself in the position of earning less after a year's work than a graduate who is joining the firm for the first time under a new year's salaries.

Soon we will be interviewing graduates from various disciplines who have found success or disappointment in the computer industry.

If you are a graduate and are presently working in computing, please let us know of your experiences and reactions.

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SOFTWARE FILE

Microcobol comes in from the cold

SMOKE Signal Broadcasting of California has announced a multi-user Cobol to run on its micro-based series of Chieftain small business systems.

The "compact, interactive Cobol controlling all aspects of program development" is the Microcobol suite developed by CAP Microsoft, the micro specialist operation which has absorbed so much of the UK software house's profits in the last couple of years.

Smoke Signal adopted Microcobol to allow multiple users of the Chieftain to interact simultaneously under the business operating system.

The interactive text editor, compiler and linking loader are also provided, along with CAP's range of applications software, AutoClerk, for file maintenance and report generating, and AutoIndex, an automatic data storage and retrieval system.

CAP Microsoft seems to be

coming into its own after a long wait in the wings, with distributors like Hamilton Rentals and manufacturers like Smoke Signal advertising and investing in Microcobol products for their own applications.

The number of machines supporting the product range is steadily increasing — the latest is the Cromemco Series III — as is the range itself.

Presently under development is a Telesoftware facility for data analysis called Autograph. Designed to be part of a complete business system operating from a multi-purpose TV set on the manager's desk, Autograph creates colour graphs in various degrees of detail from data held on floppy discs.

The software products arm of the group, CPP, is also expanding its horizons after setbacks suffered last year in losing its licence to sell ADR and Boole

and Bobbidge products (Software File, April 5, 1979).

Altergo Software Inc is to market CPP's recently announced Improve range of performance products from its established network of offices in the US and Canada. The two companies have a complementary range of products and put a similar emphasis on the importance of affective support.

CMG motors ahead in Euro market

ADDITION to its range of computer services to the motor trade, CMG Computer Management Group has launched Vehicle Stock Accounting to help dealers keep track of stock and sales. CMG in Europe now carries out work for main dealers handling Alfa Romeo,

MDS interactive link threat to ICL 7502

A PACKAGE claimed to be the first fully compatible ICL 7502 emulator providing true interactive facilities has just been announced by MDS Data Processing, UK subsidiary of Michewick Data Sciences, for use with its Sorbus 21.

MDS has been steadily extending the power and facilities of the microprocessor-based Sorbus 21 since its launch into the distributed processing market two years ago. The package follows the IBM 3270 emulators for the 21/40 and 21/50 (CW, August 16, 1979) and is aimed at the larger ICL user.

"We see the new ICL emulator opening a large sector of the market so far untouched by us," said Tom Duddy, marketing director of MDS. "The power of Series 21 with an ICL 7502 emulator now provides ICL users with network facilities previously denied to them."

The package is likely to be an attractive alternative to ICL users looking at the 7502/10 who want interactive operation and local processing power. Under the 7502 Emulator, the Series 21 will allow communication in interactive mode with a suitable ICL 1900 or 2800 processor.

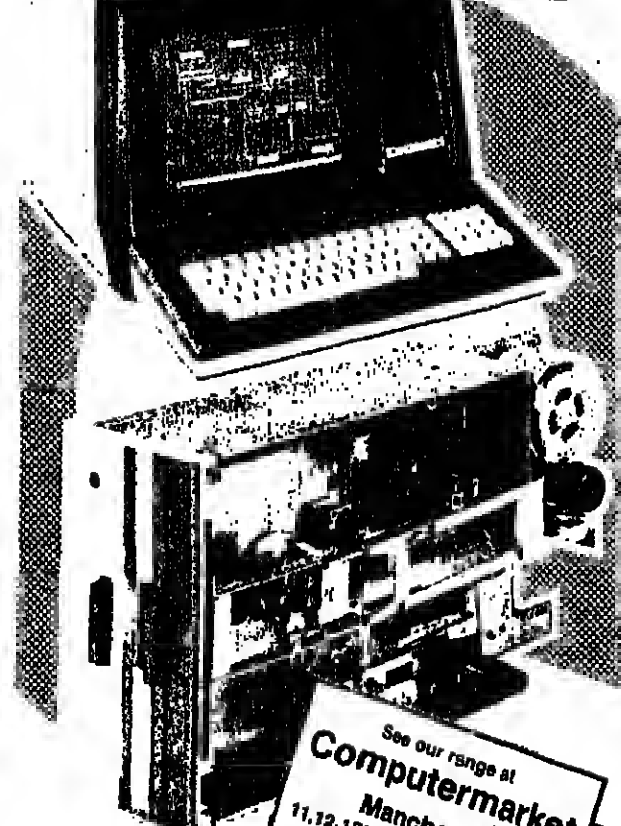
Series 1 goes into insurance

A RELATIONAL database package similar to Query-by-Example is to be developed by IBM General Systems for its Series 1, for a South Carolina insurance services firm, Siebels-Bruce & Co, which plans to market the small computer to independent agents.

Siebels-Bruce is expected to sign a large order for Series 1 soon, and the plan is to market them through a separate company to be called Agency Management System, which hopes to sell about 100 machines over the coming year.

IBM's marketing strategy for the Series 1 recently came under attack from UK software houses (Software File, December 20/27 1979), several of which have dropped Series 1 development following poor sales in this country.

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A Dickson Robinson Group Company

TOPS courses do exist north of Windsor

WE are still receiving letters and telephone calls from former TOPS students who have been fortunate enough to find a new and satisfying career through the scheme. Although there are about eight computer firms which provide training under the supervision of the Training Opportunities Scheme, no one company has a monopoly and the Manpower Services Commission encourages this trend.

However, we heard from one lady that a visit to her local Job Centre resulted in her being told

that the only course available was the ICL one run in Windsor. Are Job Centres still unaware, or the other courses which are continually being held throughout the country?

Prospective students should also be informed of the different types of training they can receive. Control Data Institute, for example, provides intensive training in RPG II, Cobol and IBM Assembler on its TOPS course while ICL only includes Cobol.

CDI's concept of training is also individualised, with emphasis on audio-visual techniques and the use of text books for self-help. ICL prefers to use a classroom atmosphere. Most ex-CDI students speak highly of the training they received.

"It's a professional company and the training was a lot better than most," said one. But capabilities and tastes differ and there can be no one-way of teaching any subject which will suit everyone.

Should the Job Centres end career officers be more aware of the differences in company policies towards training, and advise individuals more carefully as to which course they should take?

Or do potential students have no say in the matter and because they qualify for a TOPS grant, just be grateful for whatever they can get?

We shall be looking at the various different techniques. So, if you have an opinion on training methods, let us know.

Puzzler

THERE are some irritatingly clever people who can work out alphametics on their fingers, using a mixture of logic and inspired guesswork. To confound these great intellects, I am this week offering one that just cannot be dealt with in this way, because it has eleven digits instead of ten!

HAVE AN EXTRA FINGER

This addition sum is set out in base-11 instead of the usual base-10. Coll the extra digit x, and try your luck at identifying all 11 letters before turning to page 61 for the solution.

£30 Forth interpreter for d-i-y Pot owners

TWO more products have been launched into the increasingly competitive market for Commodore Pot software. For the do-it-yourself man, ACT Potsoft has

Consultancy to serve IBM System 38 users

A NEW software house, aiming to give the IBM System 38 the attention it thinks it deserves, has started up in Holborn, London. Interactive Database Systems will be providing consultancy services and education on package development as well as marketing such products as the financial modelling package Insight.

IMS/VS interface option

AN IMS/VS interface option to the Johnson Systems product, Job Accounting Report System, has been released in the UK. The new product is aimed at OS users of Jars who need to consolidate batch, TSO and IMS/VS systems into a common base for accounting purposes.

Data from the IMS/VS system log is compressed and translated

into a format from which Jars can report on use of resources and charging. Johnson Systems has been selling Jars in the UK since it set up a subsidiary here (CW, July 5, 1979) following its success in West Germany. Formerly Jars was sold by Computer Associates, which now markets its own job accounting system CA-Jasper.



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Housing Associations	✓							✓
Insurance		✓		✓		✓		✓
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Manufacturing	✓	✓	✓	✓		✓		✓
Retailing	✓	✓	✓	✓		✓		✓
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MAS run on a wide variety of computers, including the major manufacturers shown here.

If you would like further information on any MAS, please contact Brindley Reynaud at Farringdon Road.

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Hoskyns Group Limited is a wholly owned subsidiary of Martin Marietta, an international corporation with a turnover of more than £2,000m. MAS is supported throughout the world by Hoskyns and Martin Marietta Data Systems with a professional staff that exceeds 2000.

OP SPOT

'One CCT wreck can be disastrous'

A QUICK and easy way of checking printer carriage control tapes has been put forward by Colin O'Keefe of British Airways in London.

An assistant operations officer, he writes, "Get some white card, cut out pieces the size of the carriage control tape you're dealing with, and glue them together."

"When dry, punch it out to the specifications of the control tape in question. Ensure that it is accurate and you have an easy, quick and simple way of checking that future copies of the CCT have been punched correctly."

The tapes should, of course, be prepared well away from the noise and bustle of the computer room "as even one mis-punch means an entire run wasted due to output being of no use."

But, as he points out, even the best of tennis forget to check on the tapes. And under certain circumstances that can lead to serious problems.

"It does sometimes happen that there is an urgent need for a particular CCT, possibly due to one wrecking when in use and there isn't another available."

"In a situation where a job has a dedicated printer, possibly for cheques, this would be disastrous as a CCT would now require punching, checking and gluing. Time would be of the essence, owing to the task hindering core."

Hence the value of O'Keefe's aid — you still spend time punching and gluing the tape

but you can at least be sure that it is to the correct specifications.

Maintaining the stock of carriage control tapes is one of the less stimulating tasks that make up the operator's role. But, as shown here, it is a vital one.

You sometimes get contention between shifts over this matter.

In my experience, it's best to check that there are enough copies of each tape at the start of the shift rota. It stops any bickering between shift teams.

Sometimes we can't get away from jargon

RAN into a former operations colleague of mine the other day. As usual he was quick to comment on this column.

"Until very recently you avoided using too much jargon. But there was a lot of it in that report on networks and distributed processing," he said.

The report he referred to was on a conference in Infotech Operations' International Operations Management series, entitled Networks and Distributed Processing.

"Well, I certainly wasn't aware of an over-use of jargon, so I looked up the place to see what he was getting at."

As far as I can make out, the three terms he was objecting to were "streaming," "modem test" and "the level measuring set."

At the conference these terms were defined as follows:

1 — Streaming. Describes what happens when a terminal or modem is in a permanent transmit state. This is a serious problem on multipoint line as it can result in a loss of service to a lot of users.

2 — Modem test. A device used for error rate tests on TP lines and modems.

3 — The level measuring set. An aid used to check the received or transmitted signal level on a line. Not frequently used in the day-to-day running of a network but very useful when co-operating with the Post Office in diagnosing line faults.

Sorry if there is a lot of jargon in those descriptions. I hate jargon as much as anyone, as it acts as a barrier to communication.

But just what is a "good" manager and what should be the main interests in his working life? Who better to put that to than our two old adversaries, Linton and Beste.

Both agreed that he must strike an equal balance between looking after the interests of the operators and company.

On the main aim of the manager, Linton, of Manchester Polytechnic, said: "The manager must try to get the most out of his resources — his staff and machine."

"To that end he plays piggy in the middle between providing the best possible service to the users, who often expect miracles, and looking after the operators."

A strikingly similar answer came from Beste, of Datasun Inc, Worthing: "My main aim is to get the work through with speed and efficiency, and out with quality."

"You must treat your operators like human beings. I've got four teams of operators who run an IBM 370/148. They do a damn good job and I don't have to make a noise to get the best out of them."

According to Beste, many managers take the easy way out by moving the less able operators into supervisory positions and leaving the technicians where they are.

"It's all too easy for the manager to let the technician get on with his job and make someone else the supervisor."

"You've got to remember that the good technician isn't always particularly articulate. Some people are able to talk their way to promotion. Many of the best operators get overlooked."

Asked if there should be separate career paths for technicians and supervisory staff, Beste replied: "It's very tempting but I'm not sure. It's up to the managers to train the operators in supervision, anyway."

Throughout his career Beste has always been "willing to

speak my mind" and now likes his operators to do likewise.

Barry Johnson, head of operations at Univac in West London, is another who is never frightened of putting his views.

He said, "The manager must be equally loyal to his company and staff. The problem is that some managers just look after the interests of the company and don't care about their operators."

"You've got to realise that the two go hand in hand. You must look after the welfare of the staff — if you do that you are also taking care of the company."

The operators must be considered, or even better, consulted, when the manager is altering the shift pattern or re-considering the layout of the computer room.

Said Johnson, "At many installations the operators get no say about the planning of the computer room. Yet they are the people who have to work there."

"When choosing a shift pattern you've got to think how it's going to affect the health of the operators."

Incidentally, one manager I know pointed to a general opacity among operations staff, saying that many of you are not interested in training and careers, just money.

Well, I know that's not true from the letters I have received from many of you complaining about the lack of opportunities for operators. But the response I got to that original piece on operations managers was a disappointing blank.

Music's controversial role in computer room

MUSIC while you work in the computer room — does it promote an atmosphere conducive to work or cause the operators to be over-casual and play around?

"What do you think?" asks an operator who works at an installation where staff were allowed to bring radios and cassette players into the machine room until a "small incident" occurred.

He writes, "You know how nerve-racking the evening and night shifts can be, especially when the very long-running programs are on the system."

"We brought in our cassette players and radios to provide a bit of music and so break up the noise of the system and air-conditioning equipment."

There are many other ways of keeping yourself amused on the evening and night shifts and still remaining within the rules of the installation. These include playing cards, chess, backgammon, and table tennis and so on. Only the meanest of managers could possibly object to such forms of amusement.

Well, in my experience, managers do expect their staff to behave in a serious manner in the machine room, which is fair enough when you consider the cost of the equipment involved.

My suggestion is this: Accept that you are no longer allowed to play your music in the machine area, but see that you get as many breaks as possible.

If it's music you want, play it in the rest room — providing you have one, that is.

There are many other ways of keeping yourself amused on the evening and night shifts and still remaining within the rules of the installation. These include playing cards, chess, backgammon, and table tennis and so on. Only the meanest of managers could possibly object to such forms of amusement.

George 2 anthology

THE George 2 User Group continues to provide orders for its Anthology of Presentations — a collection of lectures and hints given at group meetings over the past few years — to the extent that a third batch is being printed.

The Anthology costs £1.50 per copy of 100 copies and postal orders should be made payable to the George 2 User Group. Apply to Ron Linton, Manchester Polytechnic Computing Services, John Dalton Building, Chester Street, Manchester.

Opcomm's founders doing well

DO you remember Opcomm, the operations group which flourished briefly in Coventry only to fold because of a lack of interest and support?

Well, the group may have died, but all its founder members have done quite well for themselves in the industry since their Opcomm days.

Neil Butler, who was operations supervisor at Rolls Royce in Coventry, has moved to a position of greater responsibility at Coventry Economic Building Society.

Mike McGinn has made the move out of operations — he was a shift leader at Alfred Herbert in Coventry — and into programming. This has enabled him to get off shift work.

Mike Rees has moved up from shift leader to the position of operations planner at Rolls Royce in Coventry.

And best of all is former chairman Russ Bevan. Formerly a shift leader at Rolls Royce, he is now operations manager at Renk Hovis-MedDoughall in Bristol.

Such horrible habits

WHAT about this for a quote? It comes from A Career in Computing by George Penney, careers project manager at the National Computing Centre:

"An interview is a highly unnatural kind of meeting. You might as well recognise this, and present yourself for it in an unusually clean and conventionally dressed state. You may well see computer operators dressed in jeans and casual shirts, but, if you arrived dressed like that, you will immediately lose points with the interviewer."

"You may normally sit down in any company, or light up a cigarette without being asked, but not in an interview. Don't arrive chewing gum, and try to avoid off-putting habits such as picking your nose."

Now come on. I know quite a few operators who wear jeans and chew gum, but the less said about nose-picking and other "off-putting" habits the better.

by Bernard Allen

The good manager plays at piggy in the middle

Who'll be my computer Valentine?

If you cast your eyes to the top of the page, you will discover that this issue of Computer Weekly is dated February 14, a date which will automatically conjure up pictures of hearts pierced by Cupid's darts.

In our modern technological age Cupid's darts are naturally no longer subject to the vagaries of happenstance and barometric pressure. A Digital Equipment PDP-11/04 is the god's unromantic agent for 37,000 single people who now subscribe to the Dateline service.

For many, the idea of a computer interfering with their love life is even more repugnant than the idea 20 years ago of it messing up their gas bills. The enlightened readers of this publication will naturally have no such inhibitions, so we thought we'd celebrate the mythical beginning of the mating season by telling you how the Dateline computer is making it easier.

Assume, if you will, that you're a single person

trying to make pleasurable contact with another single person of the opposite sex, and that, having tried all the means you can think of to effect this without gaining satisfaction, you decide to see how modern technology can help.

In that case you're likely to turn to Dateline, which is not the only computer dating service, but is the only one with any sort of track record — it started in 1966. And the first step is to fill out a detailed questionnaire.

Port One of the questionnaire interrogates you about yourself; personal facts such as marital status and age, but also things like smoking and drinking habits. Part Two starts

by asking you much the same questions, but this time relating to what you want in your prospective partner.

It continues with what, to me, was the most difficult part of the form to complete, a section asking you about how you choose your friends.

The third part of the form concerns the respondent's personality, and asks questions about how he sees himself, what his attitude is to various social issues and how he likes spending his spare time.

All this information, once received by Dateline, is typed in, via a VDU, to the computer system.

Once the data has been entered, a matching run is immediately performed. This is a complicated process, involving 45 programs.

Essentially what happens, however, is this. First, an elimination run. If, for example, you are a non-smoker and can't stand being courted



in a haze of tobacco smoke, or conversely you are a smoker and cannot stand being made to feel guilty about it, the computer will eliminate any such incompatibilities.

Secondly, the system will try to match you with the most compatible partners.

The result is a list of up to six people who are indicated as being highly compatible. It is then up to the individual to make contact with those people and generally take it from there.

And the best of luck!

How fast could you write War and Peace?



It took Tolstoy (max 2 cps) 7 years.

Add up the total words and numbers transmitted by a busy company per week. It's frightening.

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There's only one way to combat the problem. Choose terminals that can be used by operators as fast and efficiently as possible. And which can print the data at much higher speed than the usual 30cps.

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It takes a good secretary (max 4 cps) over 3 weeks.

180 cps. Baud rate selectable from 50 to 9600. Eight compressed fonts — highly readable, even at 16.5 to the inch. European alphabets, APL etc. as options.

Pure typewriter keyboard, down to sculpted location keys. Numeric pad clearly separated.

Colour toned for the office. With solid-state electronics power supply for quieter, cooler operation.

It not only saves you line and line costs. It saves you stationery — it can print up to 218 columns on standard computer width paper (132 on A4).

Like all Digital terminals the LA120 is engineered with maximum simplicity and reliability. It can be easily linked with any of them into a common communications network, since it shares their inter-compatible standard.



It will take the LA 120 (max 180 cps) 4 1/2 hours.

Match it against lesser products — which may even sell for more than the LA120's £1,110 (send/receive). And you realise you're looking at the best price/performance offer on the market.

Send now for specifications and quantity discounts on the LA120 and other Digital top-quality terminals. Use the coupon.

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GET ONE QUESTION WRONG AND YOU'RE DEAD.

1. Do you sell computers to other dealers? ☐ YES ☐ NO
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If you answered "yes" to any of our questions, you have just been disqualified by Alpha Micro.

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THE ALPHA MICRO COMPUTER

Alpha House

MICRO NEWS

Alpha launches its 'low-end' system

SINCE taking over the European distributorship for Alpha Microsystems last year (CW, August 16, 1979) Alpha Microsystems UK has started to take a firm grip on the dealer network, despite some admitted "accliffes" with the original distributors, and is now launching a new system on the market.

This is the AM-101, which at about £10,000 is very much at the low end of the company's product price range. It is also the first to be introduced by Alpha equipped with floppy disc drives, which give the 16-bit processor an online memory capacity of 2.4 megabytes. The processor chip set is produced for Alpha by Western Digital in the US, and is an extended and enhanced version of the set used by Digital Equipment in its LSI-11 computer range.

Standard hardware features of the system include two serial I/O ports and one parallel port, floating point package, and a real time clock. With eight levels of direct memory access available, the standard minimum of 64K-bytes of main memory can be expanded up to 448K-bytes. Expansion is in 64K-byte increments. All this memory is equipped with error correction logic, and it is possible to use either 16-bit or 24-bit address fields, and to bank switch the memory.

The equipment uses Alpha's standard time sharing disc operating system, AMOS, which is already employed on its other, more expensive systems. This incorporates a three-pass assembler, linkage editor, symbol file generator, symbolic debugging routine, and supports a file management function.

There are, in addition, three high-level languages available for the system, Basic, Lisp and Pascal, with a dedicated word processing package called Alphaword.

Like the other systems available from the company, the AM-101 will be able to run in multi-user and multi-tasking

modes. Following taking over the European distributorship for Alpha Microsystems (and changing its name from Crownshield to Alpha Microsystems UK) the company has set about reorganising the dealer network both in the UK and continental Europe.

UK dealer manager Barry Lloyd said last week that new criteria had been developed by the company for the assessment of potential new dealers. The company took a different view from other suppliers in the industry, most of whom he said, operated a discount structure based solely on the number of systems the dealer could sell — the more sold, the bigger the discount.

"In this case this often means the more sold, the lower the level of customer support," he said, "and unsupported customers would eventually come back to us for help, and cost us money on top of the large discount given to the dealer."

In the Alpha approach, discounts will be based on the level of front-end support, both in hardware and software, that the dealer can give to the user: the greater the support, the larger the discount which, according to the company could be "very substantial".

The new criteria for assessing dealers comprise four main factors, and any new dealers will have to satisfy all four. They are: A proven ability to sell to the end user; the capability to properly install and commission a system on site; the availability of sufficient and suitable software skills; and lastly, new dealers must be of benefit to the whole dealer network.

A dealer recruitment campaign is about to be started by the company in this country.

In Europe, the company has split its marketing approach in two. For countries on the periphery of the Continent, such

as Portugal and Italy, Alpha has appointed exclusive national distributors. These must have not only suitable technical skills, but must also be sufficiently well-financed to operate without a high level of support from the UK.

In countries nearer to the home base, such as France and West Germany, non-exclusive distributors have been appointed. The total number in each country is being restricted, however, to ensure the profitability of each.



Leslie Button, chief executive of Alpha Microsystems UK, with the new AM-101 dual floppy disc microcomputer which will be launched officially at IMEC this month.

by Martin Banks

Interface card for Apple II

A SERIAL interface card that connects all RS232C compatible peripheral devices to the Apple II computer has been introduced in the US by California Computer Systems, of Santa Clara, California.

Called the 7710A asynchronous serial interface, it is fully compatible with Apple's Pascal, and features a selectable baud rate between 50 and 19,200 baud, 8 and 9 bit transmission, optional odd, even, or no parity, software programmable interrupts and a power-down ROM.

Scotland 18, 19, 20 March — Albany Hotel, Douglas Street, Glasgow
North West 11, 12, 13 March — New Century Hall, Corporation Street, Manchester
Midlands 4, 5, 6 March — Albany Hotel, Smallbrook Queensway, Birmingham
London 25, 26, 27 March — West Centre Hotel, Lillie Road, London SW6

COMPUTERMARKET '80

Your first computer?

If you're thinking about your first computer for home or office, a visit to Computermarket will save you time and money. You'll be able to compare prices in just one visit, see who is committed to your area, meet people who have installed the sort of equipment you are considering, check out after sales service arrangements with more than just one potential supplier and see computers performing the applications of interest to you. You'll see micro-computers from just a few hundreds of pounds and highly sophisticated systems costing hundreds of thousands. You'll be able to examine the enhancements you may later wish to add to your computer and check out that the system can be upgraded, investigate the availability and cost of the supplies that you'll need to get and keep your computer running. You might even actually see a silicon chip!

OEM/System builder?

Hasn't your marketplace changed since you first thought about the business you're in? 16 bit micros, mid-computers, bread-boards for peanuts, matrix line printers, smart VDUs for the price of dumb ones, famous names that you hadn't heard of only months ago. Customized or off-the-shelf, it must sometimes look like the world and his wife is starting a systems house. Who is in your business in your area? A visit to Computermarket will tell you and a lot more besides including who can supply at least cost and fastest delivery.

Computer user? If you've already got a computer, you'll know who gives the best service on supplies in your area — won't you? You'll already know where you can get short delivery and best terms on the peripheral enhancements you plan — won't you? You'll be aware of the software packages that are available for your existing equipment — won't you? You've probably thought about the additional processor (or its replacement) you will need before too long — haven't you? Why not check and be sure. A visit to Computermarket will confirm that you are right and will continue to get the best deal on peripherals, ancillary equipment, services, software, supplies... and it will give you the opportunity to see micro and mini based systems in operation just to keep up-to-date and for interest's sake — won't it?

Communications user?

Are you getting the most from your system? An acoustic coupler can cost very little and yet be the start of a communications network. Modems, multi-plexers... the hardware of data communications is developing fast and so is the environment in which the equipment may be employed. Communications experts will be at Computermarket so if it's a terminal in another part of your building, distributing data processing or starting your own satellite communications network (!), a visit to Computermarket should prove to be a worthwhile investment and a chance to study PRESTEL at first hand.

Who will be at Computermarket?

Advertisements such as these are prepared many months in advance of the exhibitions described, but it is already certain that Computermarket will be bigger than ever before — more than twice as big overall. Companies that had already reserved stands as at November (almost four months before the 1980 series of exhibitions) included: Zygal, Wootton Jeffries, Willis Computer Supplies, Which Computer?, Wespac, Wang, Versatec, Tullis Neill, Terminal Display Systems, Telem, Tektronix, Tann Synchro, Synstime, Sumlock, Bondain, Star Computer Centre, Scotia Data Products, SEMS, Selborne Computers, SEL, Rostronics, Robox, Rair, O-Pac Services, Pragma, Post Office, Plessey Peripherals, Peterborough Data, Richard Norton, Northern Software Consultants, Newbury Laboratories, Nashua, Nascom, NSC Computers, Modular Technology, Modern

Midelectron, Micro Media, Micro Data Products, Micro Centre, Micro Bits, MCS Mini Computer Systems, Lynwood Scientific Developments, Lyme Peripherals, Linn Products, Information Equipment Maintenance, ITT, ICS, Harwoods Business Machines, Hamilton Rentals, John Goldsmith, General Audio & Data Communications, Geest Computers, GEC Computers, Excel, Eurocom, Equinox, Digidata, Digico, Datum, Data Design Techniques, DRG Business Machines, DML, Cytek, Cost Effective Computing, Corner Computer Services, Computing, Computer Workshop, Computer Weekly, Computer Management, Computer Ancillaries, Computastore, Comp



PEOPLE and EVENTS



Edwin Seabrook has been appointed commercial manager for Monotype Communications. He was previously administrative manager for Anglo Overseas, the largest subsidiary of P and O.

Frank Ledger has been appointed director of computing to the Central Electricity Generating Board. He joined the industry in 1953 and has been director of resource planning in the board's Midlands region since 1975.

Alan Haimas has been named as viewdata divisional manager by Systems Designers. He joined the company in 1978 as a principal consultant to lead the viewdata team. He was formerly technical operations manager with Sperry Univac Minicomputers.

Howard Jones has become Southern regional sales manager for MDS Data Processing. He has been with the company for five years in Leeds.

Lord Hunt joins IBM UK boards

FORMER secretary of the Cabinet, Lord Hunt of Tamworth, formerly Sir John Hunt has joined the boards of IBM United Kingdom Holdings and IBM United Kingdom. He held positions in the Commonwealth Relations Office, the Treasury and the Civil Service Department before his appointment as secretary of the Cabinet in 1973.

Lord Hunt was created a life peer in the Queen's New Year Honours list this year, and served in his position as secretary to the Cabinet until 1978.

Carl Mahnkopp has been chosen to head the German office of Greenpar Engineering, near Frankfurt.

Derrick Taylor, sales director of Cantant Electronics, has left the firm to form his own company which is to market a variety of power supplies from all over the world. At Cantant, Taylor was responsible for sales and marketing, and was founder director of Cantant SA, France. He also helped to found Cantant GmbH, Germany. The new company is to be called Powerline Electronics.

Jim Kinnear has been appointed field system support manager for Poland, the USSR and Hungary with Redifon Computers. He was formerly a project manager in international marketing for Redifon.



Woods

Director helps catch thieves

A BLOW for truth, justice, and the South Bedfordshire way of life was struck last week by Robin Woods, director of Luton-based microcomputer store Isher-Woods. By adroit use of an Air Call car radio telephone, he managed to help apprehend some local car thieves.

Driving North out of Luton on the A6, Woods was involved in a near miss caused by a motorcyclist attempting to turn right across his path, and a red Ford Escort trying to turn left into the traffic stream in front of him. At the time, he was trying to place a call on his Air Call telephone.

Much shaken, but with the sanctity of all vehicles still intact, Woods made to drive on, except that the Escort drove off North at a rapid rate. Suspicions aroused, Woods gave pursuit, now calling on the telephone for the police. At up to 80mph he dodged them, while giving the police such details as registration number, route and speed.

Eventually, the police suggested he disengage from the pursuit and they would take over, which they did. Woods was later told that the police had stopped the car, discovered it was stolen, and arrested the miscreants.

DIARY

FEBRUARY 14
The IBM System 38, BCS advanced programming group, Prudential Assurance, Holborn Bars, London.

What are networks? IDPM Essex branch, County Hotel, Chalfonts, 20.00.
IBM CUA Scottish group, Dunblane Hydro, Dunblane. Tel: 01-551 1843.

Have computers any place in the doctor's surgery? BCS Oxford sub-branch, Staff Coffee Lounge, Oxford Polytechnic, Oxford. 19.45.

FEBRUARY 18
Controlling EDP in the 80s. BCS auditing by computer group, Peat and Marwick, 1 Pudding Lane, London. 18.30.

Alternatives to microprocessors. Microprocessor applications group of the IEE, IEE, Savoy Place, London. 14.00.

FEBRUARY 21-22
IBM CUA operations group, Shakespeare Hotel, Stratford-on-Avon. Tel: 01-551 1843.

FEBRUARY 27
Microprocessors for developing countries. D. Waller. Followed by wine and cheese. BCS specialist group for developing countries/ British Council, British Council Students Centre, Portland Place, London. 18.15.

FEBRUARY 28
Confidentiality and statistics. BCS/Royal Statistical Society, University of Strathclyde, Strathclyde. 18.30.

MARCH 3
SNA and its alternatives, and AGM. BCS Data Communications group, Institute of Education, Bedford Way, London. 19.30.

Scottish game attracts 428 teams

THE Scotsman management game is celebrating its tenth anniversary this year and a record 428 teams are coming from Britain, Norway, Switzerland and Rhodesia.

Devised by Edit 515, the game is played on a Honeywell 6080 computer, based at Strathclyde University, and is run in association with the British Institute of Management and Air Canada with the co-operation of the Scottish Council and the Institute of Chartered Accountants of Scotland.

The winning team will enjoy a week-long business study tour of Canada worth over £4,000. The final takes place in Glasgow in June.

Rex Winsbury has been appointed viewdata director of Intel, the subsidiary of the Financial Times and the Exchange Telegraph Company which specialises in the electronic distribution of business information.

Pat Davies has joined Computer Machinery Company where she will be involved in data entry systems support. She joins CMC from P. International.

Gerhard Parker has been appointed vice-president of Intel Corp. He presently holds the position of director of technology development. In 1975 he became director of quality assurance.

Archibald Thomas has joined Chubb Cushman financial systems division as director. He recently reorganised the division and relocated the banking and finance group to St Albans.

Circumlocution File

by Dan

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COMPUTERMARKET '80

It is recommended that you order the book before the start of the Computermarket exhibition in order to ensure that you receive your copy. Computermarket admission is not open to persons under 16 or to modest parties.

PRODUCT NOTES

Back-up storage for terminals

A MINIDISKETTE system to provide back-up storage for terminal units has been introduced by Geveke Electronics. Designated the 950/951 Micro disc, the microprocessor-based units allow over 200,000 Ascii characters to be stored on one side of a 5.25-inch minidiskette.

There are three operational modes: fast access file storage, batch-oriented data collection

and code transparent binary mode. In the file mode, file names are automatically listed on a diskette-contained directory as data is recorded. Subsequent retrieval requires only the file name to be entered into the system.

In the batch mode, retrieval is initiated by a single "start read" command. Modes can be mixed on one diskette and it is possible

to record data in one mode and retrieve it in another. The 951 version has the additional features of string-search which allows high-speed search for sequences of up to 15 characters, and a powerful disc editor system.

All operating software is stored in integral memory, so the operator is not involved in program loading.

The interface is RS232C and operation is full or half duplex at standard rates in the range 110 to 9,600 baud.

Single unit prices start under £1,000 and substantial OEM discounts are available. Delivery is ex-stock.

Geveke Electronics Ltd (CW), RMC House, Vale Farm Road, Woking, Surrey GU21 1DW. Tel: 04882 71337.

Upflow a/c system

A RANGE of upflow air conditioning units for use in computer rooms requiring either a free-flowing or ceiling supply air circulation has been introduced by Wright Air Conditioning.

Complementing the ceiling Campac flow supply system, the Europa close control range is available in four models, covering a cooling capacity spectrum from 45,000 Btu per hour (13,238 kilocalories per hour) to 120,000 Btu per hour (30,220 kilocalories per hour).

Designed as free-standing

units, they embody all components, controls and electrical wiring. On installation, the only site work involves connection to the electrical power and water supplies and to the externally ducted air-cooled condensing unit.

The range offers cooling, heating, humidification, filtration and fresh air and is available in four capacities.

Wright Air Conditioning Ltd (CW), Sampson Road North, Camp Hill, Birmingham B11 1BL. Tel: 021-773 8421.

Stand-alone version of signature verifier

INFORMER's digital signature verifier, storage and verification system is now available in stand-alone form. It consists of a dedicated 16-bit microcomputer, made by Geac in Canada, one or more disc drives, a magnetic tape deck for back-up, plus a number of video terminals and printers.

Signature capture takes a few seconds once a master signature has been photographed and digitised, claims Informer.

Optical filters at the camera lens allow for different coloured inks and backgrounds and various sizes of writing can all be brought to a standard. The system can cater for any number from 75,000 to several million signatures if extra backing store is used.

Terminals have either a six-or nine-inch screen which is pedestal-mounted and normally displays data in 12 lines of 40 characters above the signature itself. Security precautions are built in.

Informer Inc. (CW), Unit 24, Chiltern Trading Estate, Holmer Green, High Wycombe, HP15 9QT. Tel: 0494 716454.

Anadex printer upgraded

AN improved version of the Anadex DP-8000 line printer is available from Data Design Techniques and can be used as a terminal or as a stand-alone matrix printer.

Both RS232C and TTY cur-

rent loop interfaces are provided, with data rates being switchable in the range 110 to 9,600 baud. Also provided is a bit parallel, character serial interface which is Centronics compatible and permits a short-term rate of 1,000 cps and a maximum continuous rate of 112 cps, equivalent to 84 lines per minute bi-directional.

The data buffer is 1K characters which can be extended to 2K. The screen is 80 characters wide and the character set can easily be changed by plug-in PROMs. A programmable form mode and a variety of automatic print/paper feed modes are also available.

Improvements include adjustable paper feed sprockets, a strengthened print head and a self-test routine which automatically checks print and control functions.

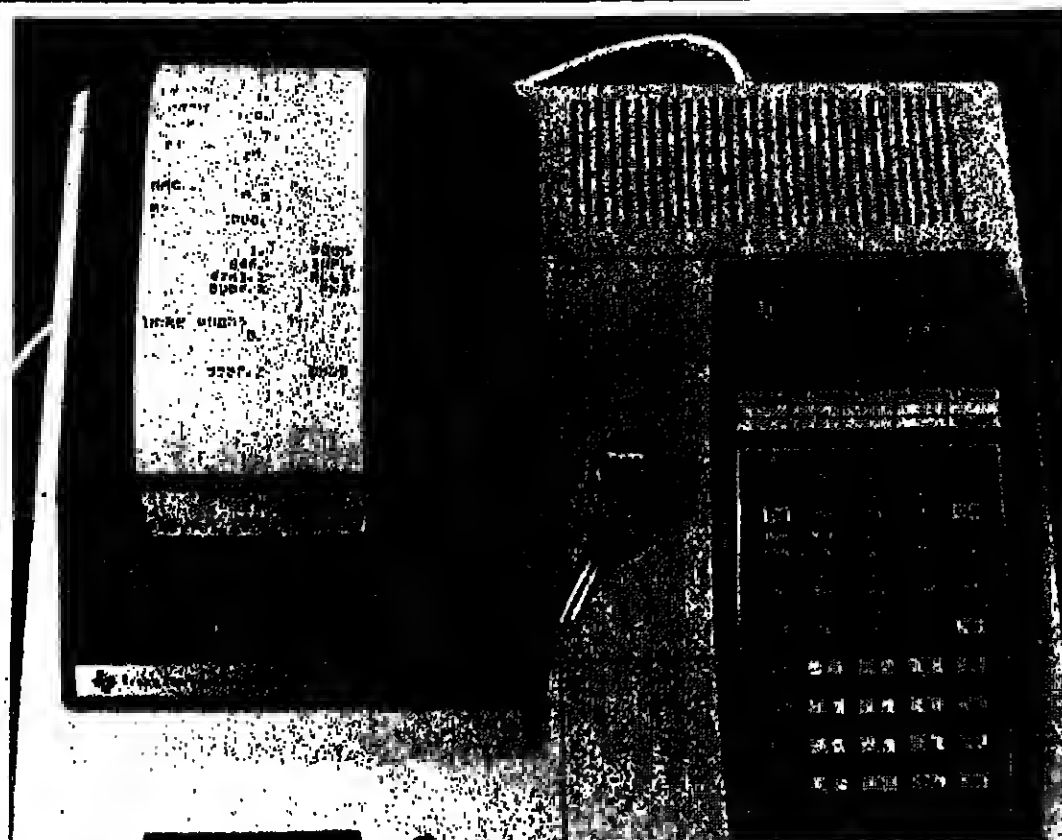
The single unit price of £256 includes delivery, installation and three months' site warranty. Data Design Techniques Ltd (CW), 12 Leaming Road, Borehamwood, WD8 4DU. Tel: 01-207 1717.

132-column screen

DACOLL of Bathgate, West Lothian, has available the M242-2 video terminal which is driven by an Intel 8080 microprocessor chip.

The terminal is compatible with the Digital Equipment VT52 as well as the Dasher 6053 and VIF7250. It also has 132 column display option and prices start from £245.

Dacoll (CW), Gardiner Lane, Bathgate, West Lothian. Tel: Bathgate (0499) 55555.



A PORTABLE computerised system (pictured above) for analysing the efficiency and energy requirements of heating and air conditioning systems and equipment is available from Carlyle Air Conditioning. It is based on Texas Instruments TI 59 programmable calculator. Called Unikel, it can calculate cooling load estimates, so providing total cooling load and required air volume and ventilation rate, says Carlyle. It can provide a similar heat load estimate and a heating cost analysis, giving running costs for various fuels.

It will select equipment and rate the performance for both heating and cooling against the required load, says Carlyle. Carlyle Air Conditioning Co Ltd (CW), Knightbridge House, 187 Knightbridge, London SW7 1RA. Tel: 01-589 8111.

VDU cleaners

A KIT of cleaning products designed for video displays and other computer equipment is available from Clean Screen Products. Each kit contains one bottle of Clean Screen, one bottle of Compu Clean and 12 video wipes, enough to clean one terminal for a full year.

Clean Screen Products Inc (CW), 24 North Wabash, Suite 823, Chicago, IL 60602, USA. Tel: 0101-312 726-8809.

Intelligent printer to be first of Russet series

AN intelligent 40-column printer, the RD140, has been announced by Russet Instruments of Richmond, Surrey. It is the first of a series to be manufactured by Russet in the UK.

The RD140 accepts data over a bit aerial interface using either RS232C or 20 milliamp current loop. Word length is defined as seven bits, with other parameters defined by the function switches. If the parity check is selected, an error causes an asterisk to be printed in place of the erroneous character. Baud rate is crystal controlled and selectable from 110 to 9,600 baud.

The printer recognises both single- and dual-byte commands for the control of intelligent features which include double-width printing, selectable word length, parity check, selectable print intensity for multiple copies and tabulation to any position.

The machine can operate bi-directionally at 83 cps at 50 Hz or unidirectionally at 41.5 cps. A one-line overflow buffer prevents loss of characters under all operating conditions.

Prices start at £489, for small quantities. Russet Instruments Ltd (CW), RIL House, Sheen Park, Richmond, Surrey, TW9 1UN. Tel: 01-840 9881.

Storage Technology's European operations will be controlled from now on by international vice-president Barry Hull who is based at the firm's headquarters at Boulder, Colorado.

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Arrow Computer Systems Ltd (CW), Rosemount Tower, Stafford Road, Wallington, Surrey SM6 8RW. Tel: 01-647 0682.

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COMPANY NEWS

Documentation finds expansion costly

PRINTER manufacturer Documentation, which is expected to unveil a high speed laser printer later this year, recorded a pre-tax loss of more than \$3 million in the third quarter ended November 9 of its financial year just finished. This compares with the profit of \$1.8 million achieved in the same period of the previous year.

Storage Technology up 48%

STORAGE Technology, the IBM compatible peripheral manufacturer, continued its impressive growth last year. Results for 1979 include a turnover of \$479 million, 80% up on 1978, and net profits of nearly \$40 million, an increase of 48%. The figures look far healthier than those announced by Memorex, Storage Technology's main competitor apart from IBM (Company News, February 7).

Storage Technology's joy was marred slightly by production problems in the fourth quarter that reduced the growth in turnover to a less spectacular 34% and profits to a modest 16%. The main problem was said to be a shortage of charge coupled devices for the 4305, its solid state alternative to the IBM 2305 fixed head disc drive. The shortage has forced Storage to go over to using 16K RAMs in the 4305 (CW, January 17).

John Stanciloff, the man who has controlled European operations as vice-president Europe, is now leaving the company to become president of Servico 800, a Dutch-based firm that provides toll free calls to numbers in the US.

Russet Instruments Ltd (CW), RIL House, Sheen Park, Richmond, Surrey, TW9 1UN. Tel: 01-840 9881.

CW SHARES TABLE

Date 8/15/10		Intr: 55.45		Chng: +0.37									
Fines		London Fines Exchange		Price		New York Stock Exchange		Chng					
1980		Stock		Price		1980		Stock		Price		Chng	
High		Low		High		Low		High		Low		High	
310	320	Applied Comp Tech	310	+ 28	49%	18%	AM International	27%	+	11%			
48	28	Brown Boveri Kraft	28	- 3	81%	10%	Argos	20	-	7%			
12	12	Corning Glass	12	- 2	81%	10%	Compag Data Pac	19%	-	1%			
18	70	Chrysler	18	- 7	84	35%	Shurgash	79%	-	1%			
100	115	Chubb	115	- 7	82%	12%	Compucon Systems	80%	-	2%			
102	102	Cole	102	- 8	80%	22%	Control Data	80%	-	2%			
812	840	De La Rue	812	- 8	18%	85%	Digital Equipment	70%	-	2%			
114	114	ITT	114	- 1	82%	12%	Eastman	80%	-	1%			
100	149	Exxon	170	- 2	89%	27	Heffner - Packard	89%	-	1%			
107	107	Farragut	107	- 1	82%	12%	IBM	89%	-	1%			
1072	1072	FRS	318	+ 24	71%	64%	Humtel	71%	-	1%			
1038	1038	General	318	- 2	70%	62%	IBM	71%	-	1%			
1038	1038	General	318	- 2	70%	62%	IBM	71%	-	1%			
373	460	ICL	373	- 8	81%	45%	Memorex	81%	-	2%			
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PDP 11/04 /34 /60 /70

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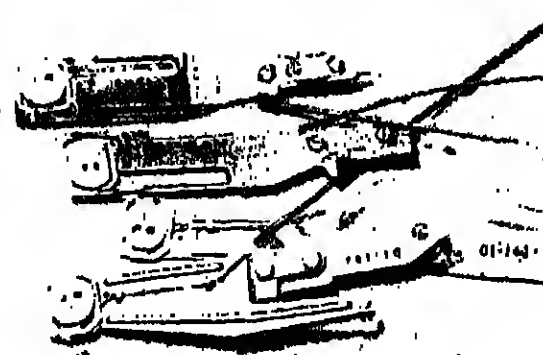
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BOOKS

Technical data presented informally

Introductory Algol 68 Programming, by D. F. Drallsford and A. N. Walker. 281 pp. £12.00. Ellis Horwood Ltd (CW), Market Cross House, Cooper Street, Chichester, West Sussex. Tel: 0243 759942.

ALGOL 68 is a very large and complicated language with many technical niceties of its own that can make it peculiarly baffling to novice programmers. There are two possible approaches to providing a text for Algol 68 courses: simply to provide a technical manual and leave the lecturer to explain how students should approach it, or provide the student with a lucid text that introduces the features of the language a little at a time with plenty of examples.

There are already several Algol 68 texts in both these categories: the infamous Introduction provides technical detail in a somewhat more digestible form than the Algol 68 Report, while there are already a number of Algol 68 teaching

texts. The present book falls somewhat heavily between these two stools; a large number of technical terms are introduced in the early stages and yet the informal style is not appropriate to a technical reference.

For example, the introductory chapter presumes acquaintance with several high level languages and hardware features of computers, and the unfortunate reader is treated to a large number of technical constructs before seeing a complete program.

The result is a book which could only be of limited usefulness as a text for introductory programming courses. Compared with some other introductory Algol 68 texts the technical information is quite extensive, which possibly gives the book a limited appeal among those who have programmed before.

Dr PETER WALLIS
Bath University

Making keyboards to order

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FROM Highland Electronics comes a catalogue showing how the products in the Series 87 range of keyboard modules and keypads can be used to construct complex keyboard layouts.

The catalogue says Series 87 components comprise single row switches with one to six push buttons and both 12 button and 18 button pads. It gives examples of bespoke keyboards and says that customers' own legends can be hot-stamped during production runs or supplied for prototyping with a legend card of commonly used symbols, letters and numbers.

Circuitry for all buttons is said to be single pole/common bus with matrix switching also available on the 3 x 4 and 4 x 4 keypads.

CHRIS YOUETT

Distillation of seven years' teaching

Introduction to Pascal, by Jim Welsh and John Elder. 282pp. £8.95. Prentice-Hall International (CW), 55 Wood Lane End, Hemel Hempstead, Herts. Tel: 0442 58531.

FACED with yet another introductory textbook on Pascal one's immediate reaction is to examine it critically to find out what is different about it.

The first thing that strikes you about this volume is its superior physical presentation: an attractive red-and-white cover encloses a book that is actually typeset — a pleasant change from the litho-printed Dioblo-Hytype output that is rapidly becoming *de facto* standard. Moreover, the book's pedigree is impeccable. Welsh was responsible for the first bootstrap of a Pascal compiler from its home in Zurich to an ICL 1008A in Bel-

fast; from there the infection spread, first to Glasgow, Teesside and Southampton, then over the country in a manner not unlike the spread of the Black Death.

For over seven years Welsh and Elder have been teaching Pascal to undergraduate students, and this book is a distillation of that experience.

With so much going for the book, it is disappointing not to be able to give it uncritical praise. Seven years' teaching experience is not to be cast aside lightly, but while this style of teaching may work in Belfast, it is not the way I would choose to teach Pascal nor, I venture to suggest, is it the way many people will want to learn it.

The style becomes apparent at the start: after an introductory chapter on computers and programming, we are immediately immersed in "notations and fundamental concepts", with detailed formal definitions of the syntax of numbers and identifiers and complete lists of reserved words and standard identifiers.

All necessary stuff in a reference manual, of course, and perhaps appropriate to an appendix in a textbook. But does one really want all this detail before being told how to write a simple assignment statement?

This same didactic approach is in evidence throughout the book. Whenever a new construct is introduced, the very first information presented is the precise BNF syntax. Then the semantics of the construct are explained, and only after all this is the reader given some examples of the construct.

All you wanted to know about bugs but were afraid to ask

Software reliability, by Hermann Kopetz. £9.00. 118 pp. Macmillan Press Ltd (CW), 4 Little Essex Street, London WC2. Tel: 01-838 6833.

EVERYTHING you wanted to know about bugs but were afraid to ask.

That seems to have been the objective Herr Kopetz set himself in this clearly written, academic-style book. He has succeeded but only at the cost of sensible discrimination and sometimes clarity. The obscure and trivial is alongside the current and important. Error avoidance in hardware and operating systems design is there with application systems and programs.

The first third of the book sets the groundwork of error theory. In particular, the new, well-accepted ideas on software structure are set out. In short, that reliability comes from a high degree of design structure with clear, minimum module interconnections.

The remainder of the book takes the reader from systems specification through to maintenance. Kopetz places greatest emphasis on the functional specification. Forty per cent of all system errors can be attributed to incomplete, inconsistent or false specification, and the importance of ample structure is again emphasised.

But a major complaint here is the author's failure to show how

the coverage of the language is comprehensive (there is even a chapter on the goto statement) and the order of presentation is fairly conventional. I was pleased to see "Procedures and Functions" treated fairly early on — in Chapter Seven. Too many authors relegate this topic to the end as something "advanced", whereas it is really the heart of modern programming technology.

In common with most programming texts, the language is presented sequentially. I cannot help feeling that this is a mistake.

In teaching Pascal one needs to get over to the student the expressive power that comes from the combination of concepts and it is difficult to show how, for example, enumerated types, for loops and arrays combine together when they are a hundred-odd pages apart.

The authors do try to show this combination of concepts in a series of worked examples, and these 17 programs are a strong feature of the book. The later examples are quite extensive (four or five pages of program) and are models of good programming style. They are reproduced from listings, complete with results — welcome evidence that they have actually been run on a real computer.

Despite the critical tone of this review, the reader should realise that this book is no worse than several of its competitors, and better than many of them. I keep on looking for the perfect textbook on Pascal, perhaps the next one I get to review?

Prof DAVID BARRON
Southampton University

Automatic error detection and correction (dealt with in later chapters), should be incorporated into this vital stage.

Automatic dealing with errors is essentially different from other methods, and requires the inclusion of redundant systems code which must fit into the hierarchy like any other.

The chapter on systems design shows Kopetz's true strength, with excellent summaries of structured and modular programming techniques and how they should be combined.

Following design and programming comes software verification accounting for 30-50% of total development effort. Technical theory seems to offer little in this area, but rather to re-emphasise the importance of the original system structuring.

Last, despite their practical importance in software (system) reliability, the chapters on maintenance and management seem to be present just for the sake of rounding off. They add little if anything relevant to the subject of the book.

This volume may be useful as a refresher for computing science students, or perhaps trainee reading for the software consultant. Kopetz would have advanced his cause better if he had taken care to draw together, discriminate and illustrate.

But here it is — bugs from A to Z for those who care to know.

DAVID CHARTER



Sterland

The challenge of the personal computer age

by Mike Sterland

THE introduction of personal computing into the British market has been a very slow process.

The microprocessor itself is not a watershed invention like the motor car or telephone, but its useful application as a personal computer certainly is. I predicted the demise of the hobby market in late 1977 and it is not until now that this has proved to be the case.

Early marketing efforts were severely tarnished by those who sincerely believed that the equipment we were trying to sell was no better than a toy. Fortunately many people were realistic and prepared to pioneer the use of these machines because they saw the equipment for what it was worth — a breakthrough in technology.

Let us consider why professional, scientific, educational and engineering personnel have taken to using these machines in great numbers. The late Dr Christopher Evans really woke up the whole nation to the impending arrival of microcomputers and the media gave him as much support and help as they could muster; but, as ever, the government got the message completely wrong.

The challenge and excitement of using a personal computer is the straightforward one-to-one relationship with a machine, and the intellectual challenge to the user.

A personal computer will mean, for some, goodbye to the protestant work ethic — they will be working at home enjoying themselves and making good contacts and strong friendships with those who live locally.

The time sharing business in the late 60s promised a terminal in every office and, eventually, in every home. Prestel may realise this dream. However, as time passed this business turned into a mammoth, impersonal and vast computer network. A lot of fun certainly disappeared.

So, many users were looking around for an interactive system that was low in price and would perform a variety of tasks. The Americans, as usual, saw the challenge and began to sell "single board interactive personal computers" and "quick service" style computer shops appeared everywhere, providing huge outlets for the new wave of manufacturers.

American suppliers totally dominate the UK industry, not because their hardware is particularly outstanding but rather because the user can enjoy the delights of all the exciting add-ons which are available for these machines. These include light pens, colour graphics, voice recognition and voice reproduction.

Currently 60% to 75% of the purchase price of one of these machines goes into slick packaging, good software and excellent manuals. It is unlikely that

the Americans will have it their way forever as the Japanese are now making some very interesting offerings backed up by high ethical trading standards.

The majority of British companies which have made the pilgrimage to Silicon Valley know only too well that currently it is a seller's market. As a result the industry in this part of the world is taking the opportunity to make deals with those with the largest bank balances.

The joys of taking on a second mortgage on your house and asking your wife to join you as a programmer or secretary are gone for ever.

There is often elitist talk about the dreadful programming standards which are said to exist in our industry. But when one looks at the people who have bought the equipment this remark proves totally unsubstantiated.

Surely highly efficient machine code programs were only necessary when half a second on a large machine could cost the user's life savings. As always, there have been prospective purchasers of personal computers who have gone shopping with a thick, detailed specification which would do justice to a consultant tendering for a hospital computer network in the Middle East.

The general purpose business software, in my estimation, is another red herring which many people are very happy to adopt. Our customers start using their personal computer for one application that makes them money, and also self-educating and fun.

Indeed, a personal computer leads quite an exciting and double life. Management training officers, accountants, scientific officers and university professors are only too happy to take the machine home after a hard day of seminar, budgeting, laboratory equipment control or computational research.

A family game of colour maths for the four-year-old, updating the household budgets, checking the record collection or merely finding a recipe for the night's dinner party (where the personal computer will be the host) is fantastic entertainment.

Let us not forget that a computer's aim is really to improve the quality of life and not, as some cynics believe, to help the police arrest more easily. A leading New York bank does 30% of its clerical work using the resources of mothers working from home. I hope many readers of this article living in the South-East would welcome the opportunity, perhaps even with open arms, not to commute.

A personal computer will mean, for some, goodbye to the protestant work ethic — they will be working at home enjoying themselves and making good contacts and strong friendships with those who live locally.

The young will, of course, be best equipped to handle this transition. Many will be able to boast at least 10 years' computer education when looking for their first "work" assignment.

Many users care little about the hardware inside their personal computer and obviously this number will grow dramatically. We are still eagerly swallowing the £200 IBM golfball quality printer with graphics that will hold tractor-fed stationery. We could also use 10 megabytes of storage which should be no bigger than a 1/4-lb box of chocolates.

Some breakthrough has been made in voice recognition and reproduction, but really we just like to issue our commands to

the machine. This development is probably nearer than we think.

Poor old Prestel — if only they would take up our suggestion of opening a personal computer program library, then it might not become a Concorde phenomenon.

Those who are demanding a 16-bit personal computer should really ask if this is for the greatest good of the greatest number. Chip yield experience in both Japan and the US, together with

escalating costs of developing a new microprocessor, from \$2 million to \$10 million being the order of the day, strongly suggest that, at this particular stage, we should use our British ingenuity to enhance the existing products made in the UK.

A personal computer is an excellent development tool, can be taken as hand luggage on an airline, can take over your own paperwork and administrative systems — no person should be without one.

Personal computing started in the US in the mid-Seventies and grew very quickly on the desire of individuals to have their own computer.

Being a technology-orientated country, they were happy to build computers from kits, and even the advent of packaged systems has not drastically changed that fundamental "personal" aspect of personal computing in the US.

In the UK the story has been different, as Mike Sterland, managing director of Personal Computers, points out. The interest has stemmed from an appreciation of how a one-to-one relationship with a computer in business and the professions can be used to advantage.

Exploiting this has, however, caused problems for some companies, especially in dealing with the dominant US suppliers.

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Communications 80 will attract visitors from all over the world (from 69 countries at the last event in 1978) who will be coming to see the latest developments in communications technology displayed by leading international manufacturers. Many of the visitors will also attend the integral conference, organised by the Institution of Electrical Engineers in association with leading international learned societies, to learn about the latest technical advances in communications equipment and systems.

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Sequential files on direct access devices

HERE are a number of reasons why the file designer may decide not to hold a sequential file on magnetic tape. These include: low bit-rates; Small files; Some direct-access requirement; frequently sorted files; Very high transfer rate; and requirement for very low error rates.

Small files

Although it is possible to store more than one file on a magnetic tape, it is seldom done. This is because the tape has to be searched sequentially to locate whichever of the files is required in any given occasion. This wastes time. It also means that in order to make only one file available, all the files on the tape must have to be issued and so are unavailable for processing.

If multiple small files are stored on direct access devices, they will be available after only short delay, usually about 10msec. This makes these devices more convenient for the storage of small files, and the fact that security checks will include the area of the device that can be referenced reinforces this superiority.

Small files will thus usually be

stored on direct access devices, or as single files on magnetic tapes, despite the waste of potential storage space this implies.

Some direct access requirement

If direct inquiries are made to a magnetic tape file, the usual method of processing is to scan the file until the required record is found. This is very time consuming, and although it would be possible for a single inquiry it is not of the question for even a few queries per hour.

Sometimes the position of the record in the file is known; in this case it may be possible to space through the file without reading records until the desired record is reached. This is still relatively slow, but allows 20 or 30 inquiries an hour. However, such requirements would slow down a sequential run unacceptably. For this reason even minimal inquiry facilities will cause the designer to use a direct access device.

If the records, or blocks of records, are stored in a format that holds separate keys as shown in Diagram 1, the file could be skip-sequentially searched. This is still slow, and is usually only used to search a track, or at most a cylinder, when the record is known to be in the area concerned.

The usual method is binary or logarithmic search. The program starts at the centre of the file area, comparing the key of the "centre" record with the required key. If the centre key is lower than the required key, the centre key in the high-key half of the file is compared next. Otherwise, the centre key in the low-key half is compared. This process continues until the required record is located. This is shown in Diagram 2 for a 200 cylinder file.

Most of the time required to locate the record is due to cylinder-to-cylinder head movements. Once the correct cylinder is determined, then no more head movements are required, and the total process will take about three tenths of a second on an IBM 3330 or similar device.

In the case shown in Diagram 2, the third head movement was to cylinder 174. However, because of the binary search pattern, five more head movements were required before the required cylinder was determined. This can be considerably improved by using a statistical search.

Record keys are usually fairly randomly distributed in a key sequence. If this holds for a given file, a rough calculation will provide the approximate position of the record. When the first comparison is made, this same rough calculation is used to give a second estimate of the record position.

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by Owen Hanson and Norman Revell

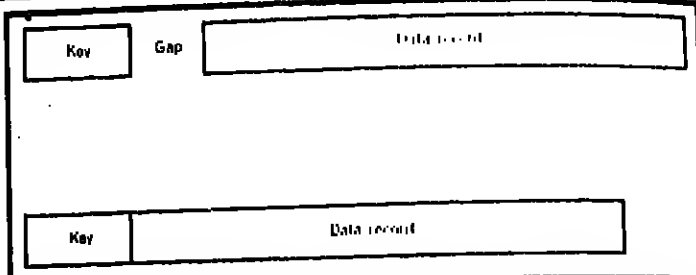


Diagram 1. The upper format allows records to be skip-sequentially processed as the direct access device control unit can compare each key with the required key and read records into the main storage only if necessary. The lower format does not allow skip-sequential processing of sequential files as every record has to be read in to determine whether it is required. Discs that are basically organized into sectors, such as those used with ICL's 1800 series and IBM's 3370 with the 4300 series, are not suitable for skip-sequential processing.

different key orders are thus best held in direct access devices, usually disc, permanently.

Very high transfer rates
No tape can compare its transfer rate with the potential of modern discs. Usually this is not important, as time lost due to inter-block gaps (on tape) or lost revolutions (on disc) is more important than the maximum possible transfer rate. However, occasionally an operation involves so little processing delay, clear or copy disc for example, that the full potential of disc can be used. When the processing required by a program is minimal, the designer may be able to achieve very rapid runs based on this.

Very low error rates
The reliability of modern discs, and in this context neither drums nor magnetic cards are likely to be considered, means that files for which a failure during the run is not acceptable, will be stored on disc. Winchester technology discs such as the IBM 3340, in which the read-write heads are enclosed in the disc pack, are more reliable still.

Apart from these special cases, sequential files will only be considered when the hit-rate is relatively low. In the next part we shall look at the question of how low hit-rates have to be, before it is worth considering direct access devices on the basis of hit-rate alone.

REFERENCE
1. Statistical Searching of Sequential Disc Files, by Owen Hanson, available as a City University Business School Working Paper from the Librarian, CUBS, 23 Goswell Rd, EC1M 7BH.

BASIC FILE DESIGN
A new impression of Basic File Design will be available in March and copies may then be ordered from the General Sales Manager, IPC Electronic and Electronic Press Ltd, Dorset House, Stamford Street, London SE1 1LU. Price £1.50 each including postage.

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covering data communications, distributed data processing and mini and microcomputers, Datscom '80, will be held from June 17-18 at the Palais des Expositions, Geneva. Abstracts may be submitted for consideration before March 1, written in 100 to 200 words. These should be sent to David Collins, ICS Publishing, Pabblescombe, Tadworth, Surrey, Tel: Leatherhead 78211.

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Time to set the record straight

EVERYONE has always known, even before Henry Ford articulated the thought, that "History is bunk". Computer history, alas, has proved to be no exception.

The death of Dr John Mauchly last month marked the close of a career of great historic importance for all computer people. In what precisely, though, did the historic importance lie? Not, we can be sure, where the history-synthesizers tend to place it. It must have been with a sinking sensation that readers concerned with the complex and fascinating story of digital computing scanned the headline "Co-inventor of first digital computer dies, 72" (CW, January 24, 1980).

The myth that Eniac was the first high speed electronic digital computer appears to be non-erasable yet in his lecture at the National Physical Laboratory a few years ago Dr Tommy Flowers retold the story of the wartime Colossus machines (CW, July 28, 1977). The first of these was operational in 1944, Eniac in 1946. Details are in the public literature and a photograph is on display at the Kensington Science Museum. More is to follow when the pro-

ceedings of the 1976 Los Alamos Conference on the history of computing finally see the light later this year.

So what was Mauchly's contribution, and why was it great? Eniac itself, even if not strictly a "first", was by one reckoning a monumental achievement. But something far more significant was already in the works, of which Eckert and Mauchly, designers of the Eniac, were again the prime movers. I refer to their designs for electronic realisation of the stored-program concept.

"But surely that was John von Neumann," is the instant chorus. Thua history plays her tricks, and careless chroniclers proceed to pass the pre-processed bunk down the line. John von Neumann was the signatory on behalf of the design committee of the Draft Report on the Edvac (June 30, 1945) which contained an elaboration of the Eckert and Mauchly proposal.

Von Neumann also played the subsequent promotional role in obtaining scientific credibility and financial enablement. But what does this tell us about designs for the National Physical Laboratory's Pilot ACE machine incorporating the principle? What does it actually reveal about the authorship of the proposal to fashion the

Edvac in the logical image of Alan Turing's 1937 mathematical abstraction?

Precisely nothing. It is now well established that the committee members responsible were, once more, J. Presper Eckert and John Mauchly.

As early as 1944, before von Neumann had become involved, they had prepared a document for patent purposes in which it was proposed that program and data should be stored in the same memory.

John von Neumann was the intellectual giant who towered over them all. He was one of the most profound mathematicians, and almost certainly the most prolific, of the twentieth century. It is only natural that historians would wish him to come out of it all with one of the key intellectual "firsts".

So long as the Colossus remained in the shadows of official secrecy, that wish could become father to the thought, and the thought could become father to historical bunk. For if the Eniac was supposedly the first high-speed electronic digital computer, and Eckert and Mauchly were without argument its inventors, then this would look after their niche, leaving stored-program to von Neumann.

It has not worked out so neatly. However uncomfortable, a re-shuffle along the line is required. The factual situation is listed in the table. The term "universal" has been used, as more fundamental than "stored program" and avoiding certain quibbles and side-issues. A "universal" machine is one which can be programmed to emulate any other machine.

Stored program allows looping, and confers on the machine the "universal" property. It also allows program and data to be stored interchangeably in the memory, so that programs can operate on programs, treating them as data. This commonality of storage was not a feature of Babbage's machine, and few programming languages today exploit it explicitly. But the consequences of storing a program just as if it were data are only now becoming fully appreciated.

Yet in February 1947 A. M. Turing was already addressing the London Mathematical Society in words reproduced below (text available in King's College Library, Cambridge). He had enjoyed the earliest and best opportunity to meditate on the consequentality of stored program, having propounded the abstract concept in 1937.

Indeed, at the time that the Draft Report on the Edvac was issued, Turing was busy with designs for the National Physical Laboratory's Pilot ACE machine incorporating the stored-program principle. Now, in 1947, he considered the facility which this principle be-

tows on the machine to re-write parts of its own program:

"Let us suppose that we have set up a machine with certain initial instruction tables, so constructed that these tables might, on occasion, if good reason arose, modify those tables. One can imagine that after the machine had been operating for some time, the instructions would have been altered out of recognition, but nevertheless be such that one would have to admit that the machine was still doing very worthwhile calculations. Possibly it might still be getting results of the type desired, but in a much more efficient manner..."

In his lecture Turing went on to point a moral for machine intelligence. It is therefore interesting to note the following in J. R. Quinlan's advance paper for the forthcoming Infotech State

of the Art Conference on Expert Systems:

"... a conventional program usually exhibits a sharp distinction between code and data — between the recipes for how to manipulate structures and the structures themselves. Such a program thus lacks the human self-awareness of the techniques

being employed, and cannot reason about or explain its own mechanisms."

I recently had the privilege to communicate to a meeting at the Institute of Electrical Engineering some results obtained by J. R. Quinlan of the precise kind so vividly foreseen by Turing. There is the added twist that Quinlan's machine-written

"instruction tables" proved five times more efficient at run time than any that could be prepared by hand.

REFERENCE
Expert Systems, April 16-18, 1979, Conference Centre, Duchess Mews, New Cavendish Street, London, W1M 3AD.

More information from Infotech Ltd, Nicholson House, Maldenhead, Berks SL8 1LD. Tel: 0628 39101.

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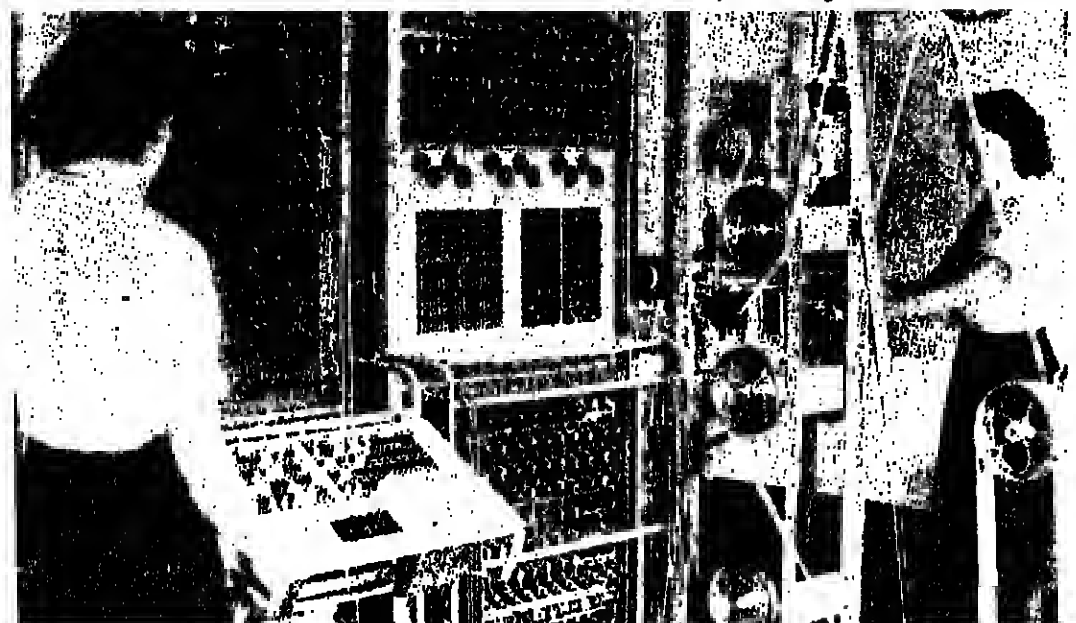
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Colossus in operation at Bletchley Park. The first of these machines went into use in December, 1943, and they played a major role in code breaking there.

The contraption of pulleys on the right was known as a "bedstead" on to which a loop of paper tape was loaded to be read by photo-electric cells.

of the Art Conference on Expert Systems.

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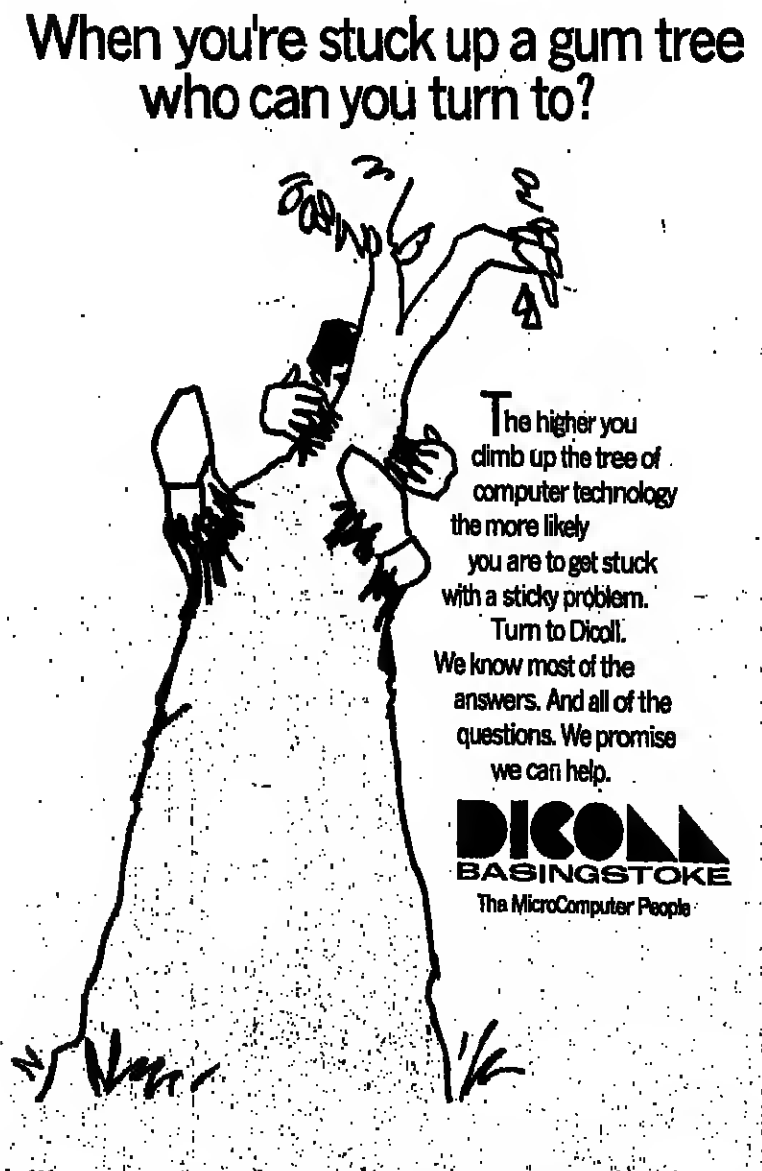
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CONFERENCES

A one-day conference on the contribution of computing and operational research in distribution will be held at the National Computing Centre, Manchester, on March 11. The event, organised by the North Western operational research group, is aimed at distribution managers, transport planners, systems analysts and operational research personnel. The conference will examine problems encountered and solutions found in the areas of local route planning, facility location, trunk haulage and strategy and computing. For further information contact R. W. Hindley, Seddon Alderson Vehicles, PO Box 7, Woodstock Factory, Oldham, Lancashire, Tel: 061-624 0388.

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SOFTWARE

Software has come of age with the new decade and to celebrate the fact Computer Weekly is devoting this supplement to some of the issues of current concern in the market place.

The software industry has all the advantages of youth — a lack of restrictive tradition, boundless confidence and optimism, and sights set firmly forward.

All well and good, but this is not the time for complacency. Perhaps the emphasis should be on learning from the mistakes of adolescence. If there is a common theme which emerges from our contributions on different aspects of the software world, it is one which urges a constructive attitude to the "people problem" and to the promising markets facing the UK software industry.

On the subject of retaining an adventurous attitude to the software market, MICK PUNTER, managing director of the thriving software house Zeus-Hermes, examines here a few of the predictions made about the industry, and adds his own reflections on the problems of dealing with a growing industry.

The industry's most crucial asset is people

PROGRAMMING is a dying art. Thus spoke the pundits in the mid-1980s. However, people should be forgiven, as well as ignored, when not forecasting accurate futures.

It was probably the same prophets who told us that computers in the 70s would be gigantic monolithic machines which would occupy whole floors of offices and control

every aspect of a company's business. Wrong again!

In fact, looking at these two points specifically, they both appear to have progressed in exactly the opposite direction. Now watch someone suggest microscopic computers for the 80s!

The software aspect of computing is now a well established individual industry within com-

puters as a whole. Taking the mid-80s as its recognisable foundation, today, at the age of 15, it is a healthy adolescent but it certainly has not yet reached maturity.

Pushed by a fast moving hardware technology combined with US marketing methods, the software industry has achieved spectacular growth. In the 1989 Computer Users' Year Book there were 79 registered software houses.

A decade later the same publication shows 650 registrations, an 8-fold increase, with some 28 companies apparently seeing both the 80s and 70s through.

Government statistics back up this expansion. The first records kept were for 1971 which show a total turnover in the UK for software packages, bureau and programming services at £59 million.

blems empirically, because they are new problems.

Software is a service industry and its most crucial asset is, therefore, people. These people are intelligent and require intellectual and environmental criteria to be fulfilled, on top of financial ones.

Most technical staff expect a high degree of communication with management, pleasant working conditions, stimulating projects and to be as far as possible away from the ambience created by corporate monoliths.

So today's software house is faced with a significant dichotomy: coping with the necessary criterion in a capitalist society, growth (especially in a booming market) and the rewarding of its staff, who require a continuing feeling of involvement and interest.

Straight growth tends to ruin the second half of the equation

by Mick Punter

The 1978 figures show a turnover of £255 million, a 500% increase on the 1971 figures. The only related aspect to decline in this period was data preparation which reached a peak of £11 million turnover in 1975 and has dropped to a steady £4 to £5 million since.

Such rapid expansion creates its own problems; the most obvious one here being a staff shortage. And, if one extrapolates the figures for another decade, the software industry will be well in excess of £1 billion by about 1984 and staff shortages will continue for the same period unless resource policies are changed now.

This is not happening with any seriousness. One important reason for the shortage of staff is the reluctance of computer users, software houses and bureaux in the 1970s to take on, train and integrate into projects persons without previous experience; though some — but not enough — manufacturers do still do this.

Since 1970, insufficient capital has been available in industry as a whole for this to be a viable short-term investment, but the software industry in the long run continues to suffer.

This in turn escalates labour costs and programmers are now enjoying salaries at double the national average (and continuing to rise).

Nice for the programmer but not for the client, four-figure weekly charge rates are inevitable and a move towards packaged systems is the resultant effect.

A trend already started but so far with no significant impact yet on custom-built systems, the 1978 turnover figures comparing at £78 million, for customisation to £43 million for packages, both areas enjoying a five-fold increase over 1971 figures.

Software houses are, to a certain extent, lucky that they are in a non-declining industry but their growth means solving pro-

blems and further, covers inefficiencies and particularly incompetence.

Small companies are able to expose incompetence but are financially vulnerable and often exploited by larger clients or suppliers. The answer, in general, has to be growth in a cellular form.

Most of the successful software houses endeavour to keep units small, personalised and manageable. Some do it by division, most separate commercial applications from the more technical fields.

However, this does not extend far enough and I am convinced that the successful software houses of the 80s will be groups trading through a number of specialist subsidiaries. The reasons are threefold.

One, the client receives personal service from experts in his field, giving him first access to the expertise and little or no red tape.

Two, the employees can rise to positions of authority where they can realise their ambitions and use their flair. This method also exposes management weakness which makes the company strong, or it dies.

Three, the employees feel involved and learn business techniques outside their direct sphere of training in programming, thus giving them business acumen.

A number of the 650 names in the Year Book today are subsidiaries of groups and have followed the outlined trend. There were no obvious "multiples" in the 80s.

Another trend is that when software houses trade above the £3 million mark they become a non-independent company. That is, a significant portion of their shares are held by a large government body or corporation.

In recent years, most of those in the "top dozen" bracket have

Turn to page 24

As manager of European Special Projects for Panaphic, MICHAEL POWELL has long been concerned with English-language type packages for streamlining DP operations and achieving end-user access. Here he shares his insight into some of the problems attending the move towards "user friendly" applications.

THE most certain trend in this new decade of uncertainty is that computers will become increasingly a part of everyday life. In 1970, the computer community was only just descending the esoteric mountain to the plain of common man.

In 1980 common man must become cognisant of the new technology if he is to be able to keep up with the constant flow of increasingly complex machinery and techniques.

The result of this tremendous expansion in data processing has been an enormous shortfall in experienced staff able both to understand and to execute computer development.

This shortfall has occurred despite rising unemployment and economic gloom. Indeed that very problem has led to a crying out for more computerisation — which is comparatively cheap when set against rising people costs.

So the job ads section of the computer Press has expanded to amazing levels, while one estimate is of 40,000 job vacancies in the UK computer industry at the end of 1979.

by Michael Powell

In the face of all this, the obvious move has been towards the training of "end users" in computer techniques. After all, a degree of numeracy should enable anyone to master the technique and have access to his data.

This trend has proved a great boon to software suppliers. More companies are acquiring powerful reporting packages and allowing the end users to access their own data.

One rapid area of growth has been computer auditing. Any computer auditor worth his salt should have, or have considered, a reporting package.

Those who have not will either be wasting their valuable time writing programs, or not be gaining a truly independent view of their data. Although the purpose of this article is not to review computer auditing the very constraints, which are of necessity imposed by auditors, bear close consideration by any DP department considering "user friendly" languages.

Let us look at those constraints in detail. The first is that data should be accurate from access by unauthorised personnel.

The difficulty about security is that it is so hard to define. One man's security is another man's hassle. Some people may want access to be restricted by file, others by record type (particularly in a database environment) others still by field and finally by actual field contents.

To go through that mire may prove so complex in itself that the non-dedicated end user will decide that it is best to leave the whole issue to his DP department.

A self-defeating, but highly attractive security system, you will admit.

The most effective ways to provide security in an environment where a report package is to be generally available are either by creating subfiles containing only the data relevant to the user or by employing a password driven data dictionary.

The 'them and us' syndrome must go

word driven data dictionary.

The former would be used where individual data values are to be secured (eg Birmingham office should not know the payroll details for London).

The latter would be employed to restrict access to critical fields or files. (Where a payroll file contains personnel data, it is not desirable for personnel department staff to have access to payroll data.) Any decent reporting system will encompass or have access to a data dictionary system.

Of course the auditor will not be happy with any barriers set up against him. The "subfile" method is certainly completely against the spirit of audit independence and access to source data. The data dictionary will prove most useful, but the scrupulous auditor will want to know all the passwords.

For some purposes, security is irrelevant (a Parts File seldom needs to be secured, for instance). However, in those cases — and even where security is important — the second constraint arises. This is control of access to data.

Whereas security involves the restriction of access to data by unqualified personnel, control is the process of ensuring that the access which takes place is logical, valid and not therefore wasteful.

Consider a simple case. Imagine that we have a stock database. A clerk has been asked to find out how many shoes are in stock and how many boots. And by the way we're only interested in shoes costing less than £10, boots above £15.

Because of the wording of the request, he asks the following:

IF ITEM = SHOES OR BOOTS
AND VALUE <10 OR >15

Of course he lists all shoes and boots save those in the £10 to £15 range.

No programmer would make that mistake (well, not many). The result is an abortive run, a waste of paper and the need to re-run.

Notice that the mistake was not syntactical, but logical. The example is trivial, but it does not take much ingenuity to see costly mistakes being made as a matter of course.

Does this mean, then, that I advocate the abandonment of end use of report generators? No, indeed far from it. What I am encouraging is the intelligent control of these systems.

The example given points to a basic area in which we must invest time when a reporting system is installed, the education of end users. This is fundamentally different from the type of education given to programmers.

With a DP competent person, one can provide a syntactical education. Although languages differ, unless they are so totally different from the norm — and some report generators like RPG fall into this category — they can be taught without much recourse to the logical specification of the problem.

Incidentally, many program-

mers show a great reluctance to learn a reporting language for fear of losing their power, and this can be overlooked by educators, causing longer than necessary learning cycles.

With the non-competent (and no disrespect is intended) the syntax must, of course, be taught. However the methodology and logical structure of programming must also be understood. The learning curve is thus longer. However, time invested here will pay great dividends later.

Without this, the user will need constant recourse to DP experts to explain why a program is not working. This will imply that the task of control-

ling the system overwhelms its benefits.

As well as the control of the system via education, the other areas of control over usage, if the system is to be successful, will be a direct billing, or, in sensitive cases, by showing what that billing would be if a realistic price were levied.

Thus the user would become aware of his cost and encouraged to be efficient in his use of resources.

Most good reporting systems will encompass routines to analyse job accounting data to give these figures.

What I am really advocating is that users, by one means or another, can be made aware of the normal constraints which are placed upon a DP department. If this happens, the "them and us" syndrome has a chance of disappearing.

It is up to us as computer professionals to disseminate our knowledge. Ours is a unique technology. Out of its very strength in complexity and ingenuity can flow the swiftness of simple-to-use and life-improving methodologies.

There is no longer need for startled ranks of Dickensian desks, quill-penned clerks and bleak emptiness. Let us not replace that emptiness with uncomprehending reliance upon a handful of technocrats.

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Minicomputer Applications	2-8 June, 1980	English
Distributed Systems	9-13 June, 1980	English
Computerised Production and Inventory Control Program Packages	22-26 September, 1980	English
Data Base Design Workshop	29 September - 3 October, 1980	English
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On the subject of retaining an adventurous attitude to the software market, MICK PUNTER, managing director of the thriving software house Zeus-Hermes, examines here a few of the predictions made about the industry, and adds his own reflections on the problems of dealing with a growing industry.

The industry's most crucial asset is people

PROGRAMMING is a dying art. Thus spoke the pundits in the mid-1980s. However, people should be forgiven, as well as ignored, when not forecasting accurate futures.

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The software aspect of computing is now a well established individual industry within com-

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Pushed by a fast moving hardware technology combined with US marketing methods, the software industry has achieved spectacular growth. In the 1989 Computer Users' Year Book there were 79 registered software houses.

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Government statistics back up this expansion. The first records kept were for 1971 which show a total turnover in the UK for software packages, bureau and programming services at £58 million.

Stroight growth tends to ruin the second half of the equation

by Mick Punter

The 1978 figures show a turnover of £259 million, a 500% increase on the 1971 figures. The only related aspect to decline in this period was data preparation which reached a peak of £11 million turnover in 1975 and has dropped to a steady £4 to £5 million since.

Such rapid expansion creates its own problems; the most obvious one here being a staff shortage. And, if one extrapolates the figures for another decade, the software industry will be well in excess of £1 billion by about 1984 and staff shortages will continue for the same period unless resource policies are changed now.

This is not happening with any seriousness. One important reason for the shortage of staff is the reluctance of computer users, software houses and bureaux in the 1970s to take on, train and integrate into projects persons without previous experience, though some — but not enough — manufacturers do still do this.

Since 1970, insufficient capital has been available in industry as a whole for this to be a viable short-term investment, but the software industry in the long run continues to suffer.

This in turn escalates labour costs and programmers are now enjoying salaries at double the national average (and continuing to rise).

Nice for the programmer but not for the client, four-figure weekly charge rates are inevitable and a move towards packaged systems is the resultant effect.

A trend already started but so far with no significant impact yet on custom-built systems, the 1978 turnover figures comparing at £76 million, for customisation to £43 million for packages, both areas enjoying a five-fold increase over 1971 figures.

Software houses are, to a certain extent, lucky that they are in a non-declining industry but their growth means solving pro-

blems empirically, because they are new problems.

Software is a service industry and its most crucial asset is, therefore, people. These people are intelligent and require intellectual and environmental criteria to be fulfilled, on top of financial ones.

Most technical staff expect a high degree of communication with management, pleasant working conditions, stimulating projects and to be as far as possible away from the ambience created by corporate monoliths.

So today's software house is faced with a significant dichotomy: coping with the necessary criterion in a capitalist society, growth (especially in a booming market) and the rewarding of its staff, who require a continuing feeling of involvement and interest.

Stroight growth tends to ruin the second half of the equation

And further, covers inefficiencies and particularly incompetence.

Small companies are able to expose incompetence but are financially vulnerable and often exploited by large clients or suppliers. The answer, in general, lies to be growth in a cellular form.

Most of the successful software houses endeavour to keep units small, personalised and manageable. Some do it by divisions, most separate commercial applications from the more technical fields.

However, this does not extend far enough and I am convinced that the successful software houses of the 80s will be groups trading through a number of specialist subsidiaries. The reasons are threefold.

One, the client receives personal service from experts in his field, giving him fast access to the expertise and little or no red tape.

Two, the employees can rise to positions of authority where they can realise their ambitions and use their flair. This method also exposes management weakness which makes the company strong, or it dies.

Three, the employees feel involved and learn business techniques outside their direct sphere of training in programming, thus giving them business acumen.

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THE most certain trend in this new decade of uncertainty is that computers will become increasingly a part of everyday life. In 1970, the computer community was only just descending the esoteric mountain to the plain of common man.

In 1980 common man must become cognisant of the new technology if he is to be able to keep up with the constant flow of increasingly complex machinery and techniques.

The result of the tremendous expansion in data processing has been an enormous shortfall in experienced staff able both to understand and to execute computer development.

This shortfall has occurred despite rising unemployment and economic gloom.

Indeed that very problem has led to a crying out for more computerisation — which is comparatively cheap when set against rising people costs.

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The former would be used where individual data values are to be secured (eg Birmingham office should not know the payroll details for London).

The latter would be employed to restrict access to critical fields or files. (Where a payroll file contains personnel data, it is not desirable for personnel department staff to have access to payroll data.) Any decent reporting system will encompass or have access to a data dictionary system.

Of course the auditor will not be happy with any barriers set up against him. The "subtle" method is certainly completely against the spirit of audit independence and access to source data. The data dictionary will prove most useful, but the scrupulous auditor will want to know all the passwords.

For some purposes, security is irrelevant (a Parts File seldom needs to be secured, for instance). However, in those cases — and even where security is important — the second constraint arises. This is control of access to data.

by Michael Powell

In the face of all this, the obvious move has been towards the training of "end users" in computer techniques. After all, a degree of numeracy should enable anyone to master the techniques and have access to his data.

This trend has proved a great boon to software suppliers. More companies are acquiring powerful reporting packages and allowing the end users to access their own data.

One rapid area of growth has been computer auditing. Any computer auditor worth his salt should have, or have considered, a reporting package.

Those who have not will either be wasting their valuable time writing programs, or not be gaining a truly independent view of their data. Although the purpose of this article is not to review computer auditing the very constraints, which are of necessity imposed by auditors, bear close consideration by any DP department considering "user friendly" languages.

Let us look at those constraints in detail. The first is that data should be secure from access by unauthorised personnel.

The difficulty about security is that it is so hard to define. One man's security is another man's hassle. Some people may want access to be restricted by file, others by record type (particularly in a database environment) others still by field and finally by actual field contents.

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The example given points to a basic area in which we must invest time when a reporting system is installed, the education of end users. This is fundamentally different from the type of education given to programmers.

With a DP competent person, one can provide a syntactical education. Although languages differ, unless they are so totally different from the norm — and some report generators like RPG fall into this category — they can be taught without much recourse to the logical specification of the problem.

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With the non-competent (and no disrespect is intended) the syntax must, of course, be taught. However the methodology and logical structure of programming must also be understood. The learning curve is thus longer. However, time invested here will pay great dividends later.

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As well as the control of the system via education, the other areas of control over usage, if the system is a real success its use will burgeon out. This will certainly justify its acquisition, but will bring in its wake various other problems.

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puter operation directly or indirectly, they must be treated properly.

The simplest way to control the amount of run time used by the reporting system is to charge for it. This can either be by a direct billing, or, in sensitive cases, by showing what that billing would be if a realistic price were levied.

Thus the user would become aware of his cost and encouraged to be efficient in his use of resources.

Most good reporting systems will encompass routines to analyse job accounting data to give these figures.

What I am really advocating is that users, by one means or another, can be made aware of normal constraints which placed upon a DP department this happens, the "them and us" syndrome has a chance of appearing.

It is up to us as computer professionals to disseminate knowledge. Ours is a technology. Out of its strength in complexity and gentility can flow the sweet of simple-to-use and improving methodologies.

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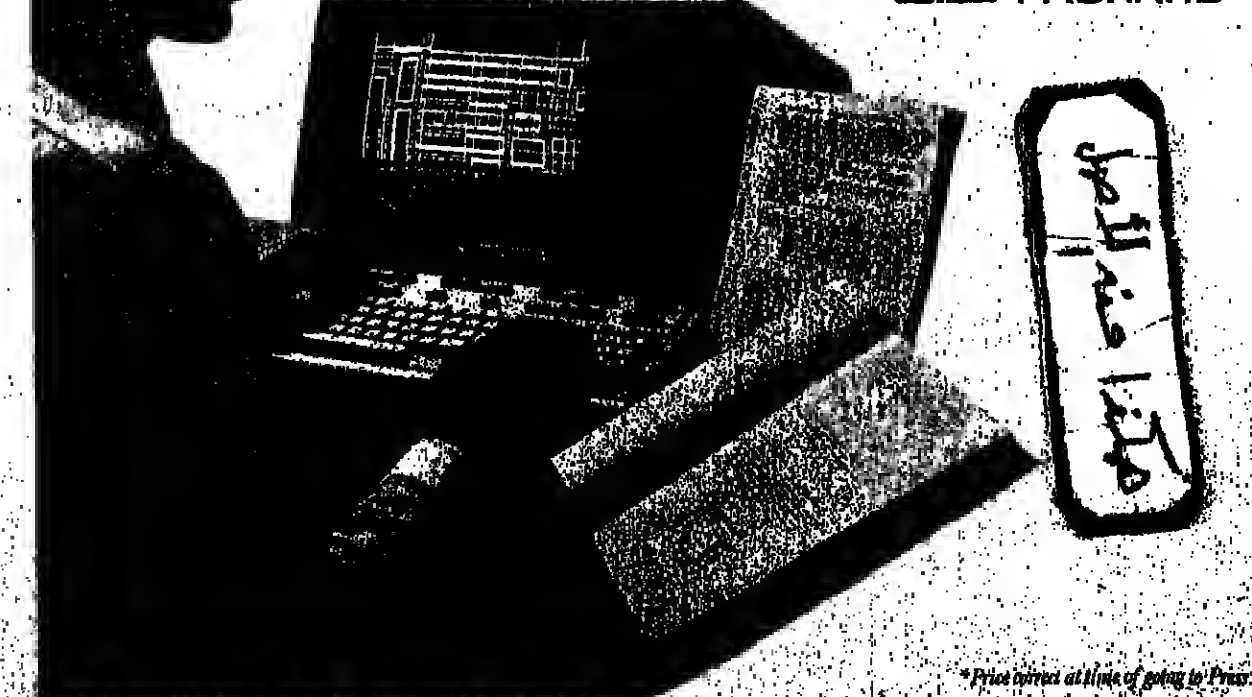
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SOFTWARE

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Data Management in ES-DOS	10-14 November, 1980	Russian
Data Base Design Workshop	17-21 November, 1980	Russian

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The micro's challenge to the thinking of British industry

by Peter Weston

As manager of Industrial Systems in CAP Reading, PETER WESTON is deeply concerned with the expansion of software into industrial applications. Finding new areas for microtechnology is no problem, but here Weston highlights the need for an organised approach to the skills on offer.

UNLIKE all previous revolutions in the computer industry the development of the microprocessor technology has a unique aspect to it. From Charles Babbage's earliest computing machine right through to the plethora of sophisticated minicomputers developed during the 1970s, computers have always been limited in their range of possibilities mainly because of the high cost of the hardware and the size of the equipment.

The introduction of the ubiquitous silicon chip and its attendant techniques has opened the way for computers to be used in a far greater variety of applications, in more types of environment and by a wider spectrum of users than ever before.

The potential of microelectronics in general and microcomputing in particular is phenomenal, with applications as diverse as micrometers and paint-spraying machines. Although good advances have been made in individual fields such as communications and automation, the nation as a whole seems to be fairly in getting to grips with exploiting the

technology. Already the media are laying the blame for the lack of progress to date squarely at the feet of the industrialists. Numerous surveys portray the UK as well down the league of countries in terms of per capita expenditure on research and development, and there seems to be little awareness of the effect this will have on British industry's ability to compete in worldwide markets in the middle eighties.

Therefore in realistic terms a certain amount of blame must attach itself to the majority of our industrial concerns, and despite significant aid from a variety of outside interests there is still a marked lack of awareness of microelectronics demonstrated by many UK companies. For this there is no excuse. Companies should make it their

business to consider the implications of current technology. Even if after looking at all the facts they decide not to incorporate microprocessor-based equipment, that is immeasurably better than just ignoring the progress made over the last five years or so.

Change is always uncomfortable and when stimulated by new technology is increasingly so, if only because of the education and experimentation implied. To British industry this must appear a jungle with very few well trodden tracks.

Software houses specialising in microcomputing provide the necessary guide to the uncharted territory and I suggest that industry should start by asking itself the following questions:

1. Can we afford to ignore

microelectronic technology? Not only should a company examine its own products and production methods but it should also be aware of the competition, seeing what developments they are undertaking and what new products they are announcing before answering this question.

2. What benefits do we hope to achieve through using microprocessors? The answers to this question may not be patently obvious. It can involve looking at two aspects of the business. Firstly, the benefits to the end products can be considered such as lower costs, higher reliability, smaller size and more flexibility. Secondly, the production process may give such benefits as increased efficiency, improved information about production performance and less maintenance. Already cabling costs are being reduced by using microprocessors as intelligent data concentrators and passing the information to a central control computer.

3. Why use microelectronics? Having identified the benefits it is hoped to achieve, it should then be considered whether there are other viable ways of achieving these benefits. Having satisfied itself on this count, management should then move to the fourth question.

4. Would we benefit from a feasibility study? The answer to this is almost certainly yes. This

style distributor agreement a success. But my guess is that no significant change of direction will take place.

The use of specialist computer consultants to bridge the "ironmongery to final solution" gap is increasing and will continue until ready-made products

become involved with NEB, or become subsidiaries of conglomerates. Another play used by larger companies is to encourage staff to purchase minority share holdings. This further personal interest in the company or group and can add the edge at the customer interface level or project deadlines. It has also proved effective in bringing employees back to the fold, a powerful ingredient in long-term labour relations in an industry prone to high staff turnover.

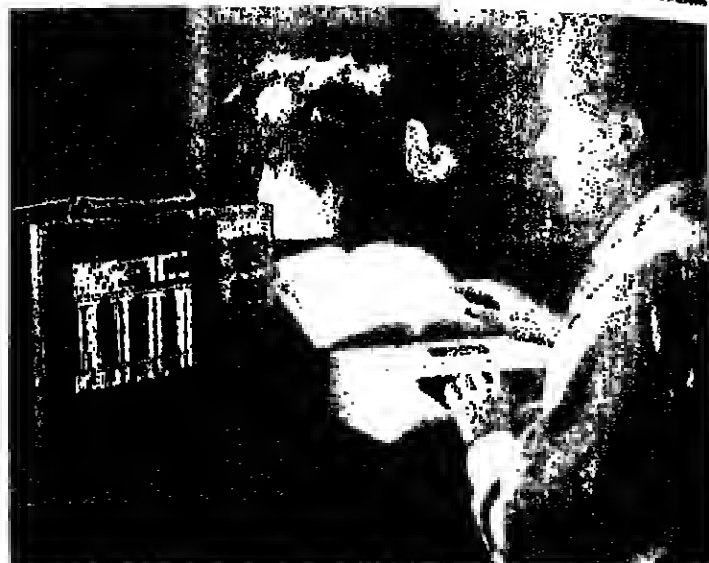
There is no doubt that the future of software houses in the next decade is strong and healthy; maybe by 1988 it will have come of age. The lack of resources will slow down general computer industry growth and will exacerbate the need for good packages, an area where disciplines must be improved.

The commercial applications are forcing package vendors to become a niche although the more technical applications by their nature will require time-hire contracts for many years.

Following the achievement of proper disciplines, mass production methods will come in software, but again this will not spell doom for the software house.

People adapt fairly well to market changes and business conditions. Maybe we will see the software house of the future becoming more like a builder's merchant, wholesaling the materials but not actually creating systems.

Certainly the first five years of the "OEM agreement" would push them that way. Few software houses are claiming the old



The Apple Two microcomputer — it and its like pose a challenge to British industry, which software houses specialising in microcomputing can help to meet.

is where the government-sponsored Mapcon program is particularly useful. By assisting in the funding of feasibility studies, Mapcon allows companies considering microtechnology to have the opportunity to assess their requirements, couch them in technical specifications and then look at the possibilities open to them.

There is little doubt that a Mapcon survey provides an extremely useful starting point and allows companies to have the basic facts in front of them before they progress to the next stage of what could be a substantial investment.

Although many companies now have their own in-house computer department, the skills and expertise required in microtechnology are different from those used on the more conventional mini or mainframe. Successfully to design and implement microprocessor-based systems requires a considerable range of skills, namely software engineering, electronic engineering and instrumentation engineering.

5. Should we employ an outside consultancy to control the project? If your company needs

to use Mapcon to buy in the expertise to undertake the feasibility study, it is highly likely that a consultancy will be needed to provide the expertise to run and implement the project.

6. How far should we look ahead? It is likely to be the case that after installing a variety of microprocessor systems a company will decide sooner or later to upgrade its facilities into a networked system. Network developments in data transmission techniques have reduced costs and increased the efficiency of linking processors. It is highly likely that industrial systems of the future will involve the development of networks, some rather than stand-alone solutions.

Microelectronic technology can — and should — be used extensively throughout industry. There is no excuse for British industry to start bleeding in five years' time when every other industrialised nation has overtaken us. We must take the opportunities that currently exist. The government, the computer industry and the trade unions are all heading that collective support. Now it is up to industry to do its bit.

The most crucial asset

From page 22

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Programming those business applications—is Cobol really dead?

AT present, Cobol is without doubt the de facto standard language for business applications. This is not only true for conventional mainframe computers; most of the minicomputers used for business systems also offer good implementations of the current Ansi 74 Cobol. Micros too, with Micro Focus CIS Cobol, which recently gained formal approval by the US Government Federal Compiler Testing Centre, and Micro-Cobol from CAP-CP.

However, despite this dominance of the commercial world, Cobol is a less than perfect programming language, as the continued high cost and long time-scales of applications development demonstrate.

In order to understand its problems one has to study the origins of the language. Cobol,

bug and Inter-Program Communication elements.

Yet another practical restriction on the portability of Cobol programs in the UK is the fact that just over half of the batch mainframes do not offer a modern Cobol compiler at all. Perhaps it should have been ICL's 1800 Cobol that was called Ada—it certainly seems to have been designed in the days of Bobbage.

Cobol's third major objective and, as a high-level language, perhaps its most important one at the time, was to provide a productivity tool not only in developing programs but particularly in maintaining them. It is in this area that Cobol has perhaps been the least successful.

One thing it has shown is that good software can still only be produced by good programmers,

processing machines, efficient or cost-effective interactive facilities for program development are seldom available on the same machine. Anyone who has worked out the true cost of a TSO terminal will realise that it is a very expensive facility indeed.

In mainframe computing, there is still a common misconception that software must be developed on the machine type on which it will run. In fact, this obsession with mainframes for software development goes

further. IBM's approach to distributed processing includes the option of restricting software development to a "central computer".

While there are arguments both ways as to the benefits of this form of control, the essential point as far as this article is concerned is that the "central computer" in IBM terms is synonymous with a large batch/transaction processing machine, most unsuitable for software development.

To summarise, the underlying

reasons for the currently imperfect world of Cobol-based applications software development are as follows:

1. Inconsistent implementations of the language—in general, however, much improved since the adoption of the Ansi 74 standard.
2. The language is not "high enough" for direct use by people who understand the problem to be solved.
3. Designed for use in a batch environment.
4. A new approach to program-

ming for business applications is now emerging, which involves new hardware, new software and—Cobol. The first element of this approach is a dedicated program development machine, utilising the new technology to provide powerful interactive facilities directly to each programmer at reasonable cost. This machine is used not only for development of software, but also for development of software, but also for demonstration

● Turn to page 26

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The software package —an alternative solution to an old problem

SOFTWARE has for long been regarded as the poor relation of the computer industry. While lavish attention and considerable funds are directed to hardware, the world of software has been very much one of making do and mending.

The appearance of a new data terminal can be guaranteed to receive maximum promotion. The introduction, however, of a new application package is often greeted with indifference. As a result of this lack of recognition, software — particularly in the UK and Europe — has had to accept almost a secondary role.

This basic attitude of DP minds is in many ways strange. The data terminal might or might not provide a new level of cost-effectiveness but it is highly unlikely to affect current levels of services and user benefits radically. But the incorporation of a new software application package could offer far more than just a marginal benefit.

Several areas of activities could benefit, commencing with

better CPU and memory utilisation, improved run times, higher reliability and immediate benefits for the user. The impact of well-designed software on the organisation as a whole often far outweighs the impact of the introduction of new hardware equipment.

I hope the dawn of the 1980s will see software gaining the recognition it deserves. Already increasing numbers of DP centres, with or without active encouragement from their users, are moving towards the utilisation of commercial, off-the-shelf packaged software. The days when independence ruled and each installation could afford the time and funds involved in inventing their own application data-wheel are happily now past.

This collective movement into packaged software is not really surprising given the advanced levels of software now being demanded by the ever more discerning user, together with the general shortage of software expertise currently found in the

by Focus

The DP world is at last directing the limelight on to software, and even the laymen begin to associate the word with computers rather than ice-rolls or lingerie. Here FOCUS examines the rise of the package and the role of the indispensable companion to the Computer Users' Yearbook.

DP installation.

Personnel resources, particularly in the programming and system design fields, are notably in short supply. What resources are available are kept fully extended in updating, amending or patching existing applications. Launching full-scale new application projects requires much faith, hope and crossed fingers on the part of all concerned.

Charity, incidentally, is not featured. It also requires a sizeable dose of time and funds, neither being in lavish supply at present in the typical DP installation.

It is not entirely unknown during the course of software

development for the entire team to desert the project in favour of greener pastures. As a consequence, the project becomes extensively delayed. Nor is it unknown for the team to run into a series of related problems, the only solution to which involves pitching-in with yet more resources in order to keep to the scheduled time-scales.

Hardly surprisingly, the DP manager under pressure from the user to implement a new application project in as short a time as possible now has to consider the alternatives available. Meanwhile, DP teams are having to evaluate methods of improving in-house productivity and reliability following firm directives from senior management. A solution in both cases could well be to investigate levels of ready-made software available in the marketplace.

At a time when economic problems face many organisations, it could well be prudent to examine the software alternatives available. Not only might an earlier implementation of a highly desirable application be achieved, but a positive cost saving could well result, benefiting all involved.

Just how the DP team goes about selecting suitable software packages is not exactly a well-charted procedure. Certainly the hardware suppliers are not a source of useful guidance. Few maintain central listings, and as a result any recommendation made is presented as being a personal opinion of one individual representative.

Apart from the limited range of manufacturers' proprietary packages which in the main concentrate on systems software, there are now many specialist companies producing and supporting software packages. In the main, the emergence of such independent software suppliers is a direct result of software unbundling by IBM back in 1970. This action generated an entire new situation, one where opportunities became available for specialist companies to produce software packages. The current software industry marketplace in the US

alone is now valued in excess of \$2 billion with annual growth running at over 30%.

Unfortunately, while the quantity of software packages has greatly expanded, the quality of software has not necessarily kept pace. Before taking a packaged plunge, the potential user must obtain satisfaction on such factors as:

- Has the proposed package been fully tested, bugs ironed out and the system successfully implemented? Confirmation on these points should be obtained from existing users.

- Will the package run on the hardware configuration available to the purchaser? It is all too easy to overlook the size of memory required or the stipulated minimal peripheral requirements.

- Is the package capable of being enhanced as and when desired? In this respect, good documentation is essential.

- Has the software product been designed in a high-level technology format? If so, will the installation team be able to unravel the complexities — and potentials! — of the package? This is particularly important in such areas as operating, training or subsequent amending.

Perhaps, however, the major factor to be investigated when choosing software packages is that of suitability. How close is the product to that desired or specified by the ultimate user? Does the package incorporate the latest knowledge and features desirable to put it in the forefront of the industry which it is serving?

The acquisition of any ready-made package is only cost beneficial if it performs at least as well as on in-house produced system.

Choosing the most suitable package is not necessarily the most difficult challenge. The major problem area is more likely to be that of discovering whether in fact such a software package exists, and if so, where. Until recently, there has been no sustained effort to provide either helpful guidelines or a product listing.

In the US, the research organisation, Datapro, attempts an annual user poll to establish an honour ratings roll. The most recent involved over 8,000 ratings on 2,000 individual software packages. The end result of all this activity was the compilation of a rating listing on over 300 proprietary packages. As the survey makes clear, the results cannot be taken as a basis for establishing the worth of each product. Lack of any accompanying technical information

negates much of the value of the exercise.

However, a new attempt is now under way which it is hoped should provide the prospective software package user with a practical basis for evaluation. This month, the publishers of the DP manager's friend, The Computer Users' Year Book, are producing what they confidently hope will become a new industry reference work, the International Directory of Software. Whether these hopes will be justified will no doubt be established in the months to come. There is no doubt, however, that the compilers have left very few software packages "untouched" in their quest to establish the first major international listing of packages.

Over 3,000 independently marketed products are exhaustively identified, analysed and classified. A highlight of many such publications is that of information retrieval, the CUYB itself being no exception. In the case of the Software Directory, much care and attention has obviously been given to the problem. Not only are products indexed by main categories, but there is a complete alphabetical index by both product name and acronym.

In no way can the listings be called perfectionist. Each product is analysed by history, function and technical operating requirements. The suppliers themselves are not spared the in-depth analysis. Each vendor is profiled in order to reveal such vital information as levels of support supplied, numbers of staff employed and product costs.

A particular benefit of the listing is the number of users worldwide of each product.

The directory has been formatted into three main categories: system software, application software and industry-specific software products. This permits the user, whether first-time user of a small business machine, or fully experienced user of a large-scale computer, to evaluate exactly what the market has to offer.

For the small business user, requirements may well be limited to acquiring an "accounts payable, receivable, general ledger, payroll" package for his new machine. Meanwhile the IBM 4300 user could well be investigating the feasibility of buying a ready-made "data management, dictionary, graphics system."

The success or otherwise of the computer operation has long been determined by its level of software. Making the best of a bad, poor or inadequate software job has occupied much time and attention of the DP professional. It has also taken up a considerable amount of time from the user. In the past five or six years, hardware on a cost/performance basis has improved out of all recognition. It is time that software matched the improved performance opportunities. Choosing ready-made software products could well mark the turning point.

International Directory of Software, £38 plus postage, £27 per publication office. Computer Users' Year Book, 430, Holford Road, Bournemouth BH18 9AA.

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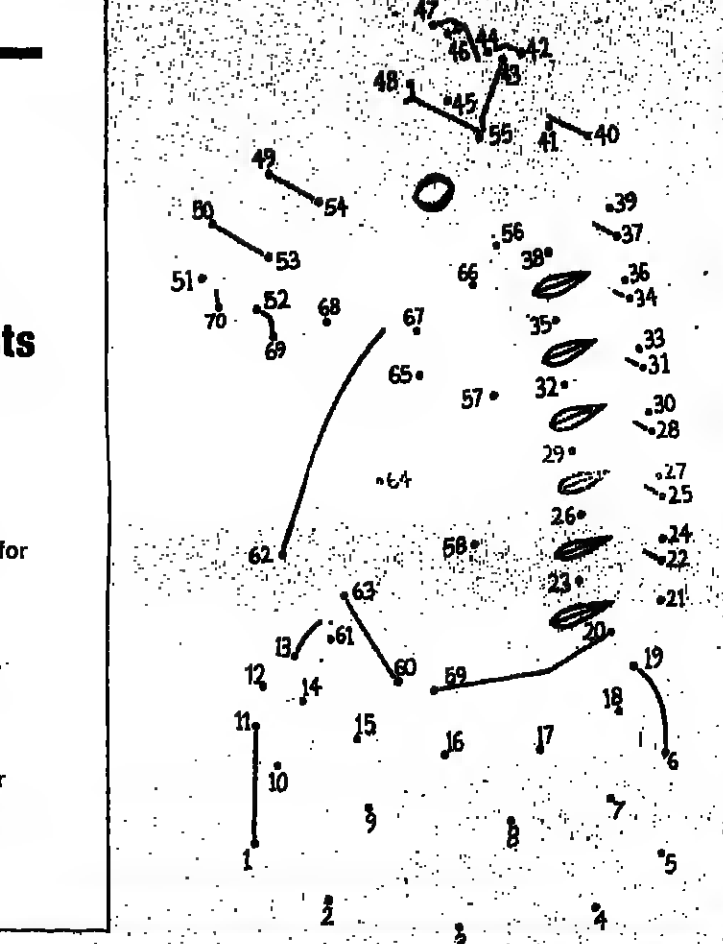
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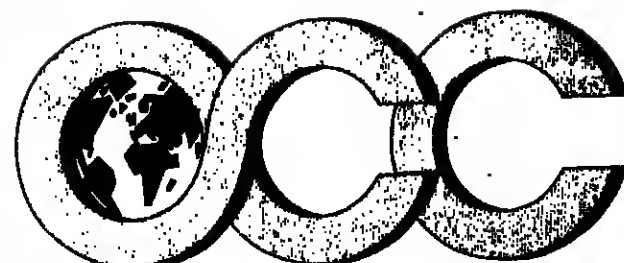
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Our client requires a Manager to be responsible for the final quality control of all its products and to support the marketing/systems engineering teams as and when necessary. This will involve new product monitoring and initial field testing, mainly in the UK but short duration trips abroad will also be available, particularly in a trouble-shooting capacity.

The newly formed department liaises world-wide to ensure customer enhancement requests are actioned quickly and efficiently so maintaining their high standard of service. Technical bulletins and departmental standards are also generated by this group.

In-depth DOS/VS experience and a knowledge of systems software packages (eg GRASPVS, POWER/VS, EPAT, JARS, FLEET, PANVALET, etc) are firm requirements and exposure to IBM Assembler will be expected. The personality to communicate with customers at managerial level and to work alongside their technical personnel is of prime importance.

With offices on three continents, the Company is a well established organisation that can offer several career paths to the successful applicant. Pension and life assurance schemes, coupled with an exceptional disability scheme, add security to a five-figure starting salary. Full relocation expenses are paid in appropriate circumstances.

REF: S1/1402

OPERATING SYSTEMS SOFTWARE DEVELOPMENT ASSEMBLER EXPERTISE

WESTERN HOME COUNTIES

£8,000 TO £10,000

This is an ideal opportunity for people with good Assembler expertise to progress their career in the rewarding field of software development. Joining small project teams the successful candidates will have the opportunity of designing and developing advanced software within a major world-wide organisation.

Applicants should have gained solid experience of Assembler in either a Systems Programming or Applications Programming role. Those persons who also possess an in-depth knowledge of DOS/VS, will command salaries at the higher end of the range.

- ★ Technical Challenge
- ★ Wide Range of Projects
- ★ State of the Art
- ★ Stimulating Environment

- ★ Successful Company
- ★ Financial Reward
- ★ Career Progression
- ★ International Opportunities

In addition to a competitive commencing salary and an outstanding career opportunity to direct future software development, the Company is able to offer a comprehensive benefits package which includes a free restaurant, an exceptional disability scheme and pension/life assurance schemes. The company has new purpose built offices in delightful countryside offering a wide variety of accommodation for those wishing to move to the area for which a generous relocation package is available.

REF: S2/1402

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NEW YORKER'S SALARY

New York is the heart of the computer industry, the most advanced Data Processing environment in the world. The experience alone that this city offers in sophisticated business and financial systems will prove invaluable in your career.

Our Client, Computer Technicians Incorporated—Systems Division, a US based consulting firm, is seeking Programmers and Systems Personnel to join a major US bank located in the Wall Street area of New York City.

Candidates must have a knowledge of IBM and/or NCR systems. Opportunities are available for
PROGRAMMER ANALYSTS
with a minimum of 3 years experience.

N.Y.

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SYSTEM ANALYSTS
SENIOR SYSTEMS
ANALYSTS

So join us in the most exciting D.P. centre in the world. Just send us a brief personal history and outline of career to date to either address below or telephone David Hanly at Dublin 379804.

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MVS/JES2 Support

Holland

£18,000 + p.a.

We are seeking an experienced Systems Programmer to undertake a one to two year assignment at an expanding MVS Data Centre in Holland. Current hardware includes an Amdehl/V7 with 16M and 18 channels plus a 5M 370/188 running MVS rel. 3.7. Major upgrades of both cpu's to a VS and 3033 respectively are planned for early this year as well as implementation of MVS 3.8 and SE rel. 2.

The successful applicant, who will have a minimum of two years systems programming experience including some experience of MVS, will work with another of our Systems Consultants in a small team responsible for all aspects of MVS generation and support.

Remuneration will be according to experience, but will not be less than £18,000 p.a. For further details, please telephone or write to Brian Bidston at CDS or call during evenings/weekends on 03448 6386.



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NORTH WEST

PRESTON to £7300

PROJECT LEADER
Our client is seeking a candidate with over 4 years data processing experience including POP 11 hardware. You should have had leadership and control involvement or the potential to take up a Project Leader role.

MERSEYSIDE to £6500 + BONUS + BENEFITS

SENIOR ANALYST
One to expansion this large, prestigious company require further Analysts to work on advanced IBM systems. You should have over 2 years general experience, preferably with a programming background.

MANCHESTER From £4500

COBOL PROGRAMMERS
Our client requires further programmers for long term developments. You should have 12 months COBOL on any hardware, preferably with some on line experience. These jobs are in an expanding environment and offer very good prospects.

PRESTON to £6500

SENIOR PROGRAMMERS
This company is becoming a number of sophisticated developments on new mainframe and mini hardware. Requirements are for two Programmers with over 2 years COBOL, and some on line experience.

MANCHESTER c £7000 + BENEFITS

SYSTEMS ANALYST
This company is seeking an Analyst with good design experience in a manufacturing environment. Data base developments on IBM hardware.

MANCHESTER £6000 + CAR + BONUS + BENEFITS

SYSTEMS CONSULTANT
A highly professional, well established systems house is seeking an Analyst with over 12 months general commercial systems experience, and programming background. You should be personable and used to user contact/liaison.

BLACKBURN to £7800

ANALYST/PROGRAMMER - MINI'S
Our client is seeking an analyst/programmer to work on mini hardware. You should have a good knowledge of COBOL and some experience in programming experience on any mini. Analysis and design background essential.

MANCHESTER to £7000

ANALYST/PROGRAMMER
This company have recently installed new main frame and mini hardware. They now require Analysts/programmers with good COBOL, and some analysis involvement. Systems under development are on line and data base linked.

MANCHESTER £7000 to £7500

SENIOR ANALYST
Our client is seeking a Senior Analyst with good manufacturing experience together with a programming background. The company operate ICL hardware and although not essential ICL experience would be an advantage.

MANCHESTER c £5500

COBOL PROGRAMMERS
If you have 2 years ICL COBOL experience and wish to work on real time systems this major company can offer excellent prospects on large hardware.

LIVERPOOL NEG. c £5700

PROGRAMMERS
This company is seeking a number of programmers with a COBOL, PL1 or IBM Assembler background. If you have 2 years experience this company can offer excellent prospects.

LIVERPOOL c £5400

COBOL PROGRAMMER
This small installation requires a young programmer with around 2 years general commercial experience and other a high degree of involvement.

Contact STEVE SYKES on Leeds (0532) 444185 (daytime) or on Leeds 662417 (evenings and weekends) or write with brief details (no stamp required) to Lorien Computer Services Limited, FREEPOST, Leeds LS7 3VY.

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Recruitment Consultants
OCS House, Servia Road, Leeds LS7 1NJ
Telephone 0532 444185
*(24 hour Telephone service)

Midlands

BIRMINGHAM c £4500

PROGRAMMER
If you have about 18 months COBOL experience then this company can offer in return a new computer and opportunity to learn on-line and data base techniques.

WEST BROMWICH £ Neg.

TRAINEE PROGRAMMERS
We are currently seeking for trainee programmers who have a degree or equivalent in a computer discipline to work in a modern or planning installation.

WARLEY to £7000

SENIOR PROGRAMMER
This client is seeking an experienced COBOL programmer who can lead a team of programmers and trainees. They are offering new equipment and excellent career prospects.

BIRMINGHAM to £6000

PROGRAMMERS
COBOL programmers with 2 years experience are invited to apply for their posts and develop their skills in a manufacturing environment.

COVENTRY to £5,500

PROGRAMMERS
Experienced COBOL programmers are required by this large manufacturing company. Experience of large IBM systems an advantage.

WALSALL c £5500

PROGRAMMER
We are currently seeking a programmer with 2 years COBOL experience. Knowledge of ICL 1900/ GII or 2900/OME an added advantage.

WALSALL to £6500

SYSTEMS PROGRAMMER
This client is changing from an ICL 1904S to a 2956. They need a systems software person who can look after GEORGE II and/or OME in a real time environment.

BIRMINGHAM c £6300

SYSTEMS DESIGNERS
Do you have 3 years experience, a programming background and a good education? Then this company needs you to assist in the development of new on-line systems.

BIRMINGHAM to £7500

+ BONUS + CAR ALLOWANCE
SYSTEMS ANALYST
We now need just one more systems analyst for this expanding house to work on large projects. You will have sound experience in the analysis of commercial applications.

COVENTRY to £8000 + OVERTIME

SYSTEMS ANALYSTS
A large multi-faceted company need analysts with commercial and/or production experience. They offer in return excellent working conditions, paid overtime and superb career prospects.

WALSALL c £6000

SYSTEMS ANALYSTS
Systems analysts who have good experience in being sought by this company to develop real time order processing and locker systems.

COVENTRY to £6500

SYSTEMS ANALYSTS
This client has an urgent need for systems analysts who can settle into a large environment and develop new systems. Preference will be given to those with payroll, sales or marketing applications experience.

Contact PETER GILBERT on Leeds (0532) 444185 (daytime) or on BRADY (0274) 634074 (evenings and weekends) or write with brief details (no stamp required) to Lorien Computer Services Limited, FREEPOST, LS7 3VY.

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IDMS SYSTEMS AND PROGRAMMING

One of our Dutch clients is currently entering a phased development of an on-line Property Registration System which is due for implementation in early 1981 and where the hardware comprises, Siemens 3000 (IBM 370/158 OS MVS compatible) equipment. The flexibility of the project, however, allows for hardware independence therefore, knowledge of a specific hardware system is not essential; more important is a sound background in IDMS Database techniques. For this task we require:

Systeme Analyste, Project Leeders and COBOL Programmer/Analysts.

The projects are:
Enquiry Systems
On-Line Transaction Handling
Archive Systems
Report Systems

No language problems are anticipated but, nevertheless, senior team members will be taught Dutch if necessary. Senior members will also be required to contract for a minimum period of one year.

SENIOR PROGRAMMER
with INSTRUMENTATION or PROCESS CONTROL experience. Knowledge of RMX 80 multitasking operating system and/or ISIS II advantageous. Hardware INTEL 8080.

DATABASE CONSULTANT
to instigate a database structure and reporting system in an IBM 370/158 and 188 environment. A first-class knowledge of IMS Database batch processing for report listing and on-line processing for enquiry handling must be held.

Location: The Netherlands.

3790 PROGRAMMERS
to continue development of a distributed processing system and thus good previous experience of 3790 communications processing and macro assembler is essential.

Location: The Netherlands.

IBM PROGRAMMER/ANALYSTS
to continue development of commercial systems for a multi-national distributed processing group. Familiarity with structured programming techniques and knowledge of IBM 370/138 hardware running under DOVS, POWER/GRASP. In a COBOL environment will be looked for, together with a minimum of two years experience. An upgrading to IBM 4300 Series is already in progress.

Location: The Netherlands.

RPG II PROGRAMMER
to support general commercial systems running on IBM System 34 hardware. These include order processing and financial systems and, although not mandatory, some knowledge of COBOL could well be advantageous. Again, good previous experience will be looking for.

Location: The Netherlands.

COMPUTER OPERATOR
for night-shift work on an IBM 370/138 running under DOS/VS and POWER/GRASP. In an environment also using CICS, VTAM and SNA.

Location: The Netherlands.

TECHNICAL AUTHORS (HARDWARE)
are required for a number of clients to write handbooks on digital equipment and telecommunications subjects. An ability to write clear, concise English will be looked for.

All the above opportunities carry really first-class remuneration — together with generous concessionary already negotiated with the Dutch tax authorities — plus four weeks paid holiday per annum, paid national holidays and certified sick time, as well as a holiday bonus and the full support of the administrative staffs based in our Dutch offices.

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Industrial Artists (Hitchin) Limited,
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Recruitment



In Informatics

Systems Programmers

Greater London, Salary: £11K + benefits

This position represents a rare and outstanding opportunity for a Data Processing professional to enhance his/her career with one of Continental Europe's leading Consultancies and Total Systems Suppliers. The company has recently formed a new Mini Computer Division and now wishes to appoint a Software and Systems Programmer who will report directly to the Software Manager. The successful candidate ideally should be aged 25-30 years with a degree in a Computer or related subject combined with three or more years work experience in the following areas (in order of importance): Basic Software Development and Generation, Compilers,

Operating Systems and Emulators, Multi-Processing techniques and real-time communications/networking. A proven ability to work as a self-starter is absolutely crucial as are personal communication skills. Besides a well above average salary which reflects the prominence our clients place in meeting this requirement, the company offers a comprehensive range of benefits and allowances including a fully paid company car. It is envisaged that the appointment will be taken up in March/April, 1980. First interviews will be conducted in our office.

Ref: 14/2/A

Mini + Micro Software

Challenging opportunities in Holland

This highly regarded Systems Consultancy Group is in its areas of specialisation, the acknowledged market leader in Holland. If you consider yourself ready for a career step that will probably give you ample technical & promotional potential to take you through the 80's then this is your next move. Openings exist at various levels of seniority in the areas of Mini & Micro Systems, Communications, Message Switching, Process Control, Real-Time Banking and Distributed processing. 2-6 years Assembly background is essential and a degree in a numerical subject is desirable. You will be working in a technically professional environment offering both independence and complete responsibility for defining and executing demanding projects. You will be based in one of Holland's principal cities where superior housing is readily available and recreational facilities plentiful. You will be close to Germany, France and Belgium but to mention England just 45 minutes away. In addition to a significant salary package (including local conditions) and full medical expenses you will also receive: Initial accommodation allowance, Assistance with house purchase, 4 weeks holiday + 8% bonus, Sickness-in allowance, Medical Insurance and Pension scheme.

Ref: 14/2/B

Salaries in the range £11-16K

Micro - Processor Applications

Home Counties & West Country, Salary: £6-8K

A well established, U.K. based company, is currently seeking Applications and Systems Programmers who are keen to enhance their careers by contributing to state-of-the-art development on mini and micro-based business systems. Systems Programmers will be expected to have at least 12 months experience of either COBOL, BASIC + or Assembler. Whilst our client has a stated preference for exposure to DEC, Zilog and Intel hardware it is willing to consider applicants who have appropriate language experience on any mini or micro computer. Applications

Programmers will have recent business applications experience on small micro/mini orientated systems and those candidates who can offer word-processing expertise will be especially welcome. All positions will be of particular interest to young professionals who wish to keep abreast of technical developments whilst enjoying the benefits of a rural setting. We will conduct interviews in our offices in London after which "short-listed" applicants will visit the companies Head Office.

Ref: 14/2/C

Message Switching & Comms

West Europe, Salary: to £18K

A prestige European Systems House and Consultancy having its Headquarters in Paris wishes to expand and establish a small specialist team working in the areas of Data Communications and Packet/Message Switching. This is a very rare opportunity both to enhance your career by extending your social and linguistic horizons and developing State-of-the-Art D.P. technology whilst having the benefit of living in one of Europe's most beautiful cities. Successful candidates will be either graduates in a numerical subject or alternatively have in-depth knowledge in advanced

computer applications. Currently you will probably be employed as a Systems Designer, Software Engineer or Real-Time Specialist in a mini-computer environment with extensive Assembler experience. Those candidates who have a working knowledge of French or German will be especially welcome. Lastly, there will be an opportunity during the course of employment to travel to both the U.S.A. and other European countries on project assignments.

Ref: 14/2/D

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C. LONDON

A software house is currently undergoing a large recruitment campaign due to new products and enhancements on current systems. The minimum requirement is 1 year's experience of Basic/Basic + within a commercial environment. The rapid expansion of this software house within the last few years is ample proof of excellent career progression within a young and friendly environment. As well as an excellent starting salary (according to age and experience) the client also offers 6 monthly reviews and a car allowance.

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3 Shift working in Middlesex. Multi machine end Hardware environment.

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2 Shift working in West London. Free meals, BUPA, Pension, Insurance. New 4341 coming soon.

IBM OS £5500c

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3-shift working in North London. Minimum 1 year's experience. Any mainframe experience considered.

To £8000

£5500+

£5500c

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IBM Specialists to £15,000

Informatics, an International Corporation, hardly needs introducing - we have been providing secure, growth-potential opportunities to talented professionals for over 11 years in Britain, the US and Europe and our record for keeping valued personnel is the envy of our competitors. A further planned phase of expansion has created numerous opportunities for IBM-mainframe environment specialists including: Database designers and analysts, on-line applications programmers (CICS, IMS, TOTAL etc.), systems analysts, designers and systems programmers.

We are offering permanent career positions in London and at several of our European offices with the option of a transfer to the U.S. after a suitable settling-in period.

Numerous opportunities also exist for out-of-London based projects, throughout the South East, Midlands and North West England. European based personnel will receive excellent overseas allowances fully reflecting local cost-of-living conditions and in most cases the working environment will

be English. A few positions do however carry a foreign language requirement (French or German).

Whilst you probably identify Informatics with software packages, these products are only part of a bigger picture. Our reputation in the industry is that of an established market leader in frontier pioneering applications.

does offer top salaries is, in perspective, incidental to the total benefits and opportunities available to our personnel.

You will certainly be involved in rewarding but demanding projects - probably as a member of a small integrated team of professionals working in an autonomous environment with considerable responsibility. You will be expected to contribute new ideas and develop your already considerable skills.

Interviews will be held in London as soon as applications are received and offers will be made without any of the customary and annoying delays. Please telephone me, Karen Whelan (reverse charges accepted) or alternatively send your concise C.V. to:

informatics

**informatics
consulting ltd.**

Africa House
64-78 Kingsway **01-405-8546**
London WC2B 6AL

Whilst we are seeking professionals of varied backgrounds it is assumed that they will already be well remunerated, excel professionally, are highly motivated and ambitious. The fluid management structure of Informatics provides for a career progression through to the highest positions. The fact that Informatics

contracts for programmers and analysts

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IBM

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Texas Instruments 990 Programmers
DEC PDP BASIC & BASIC+ Programmers
SYBOL Programmers (commercial experience)

Scotland:

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SYSTEM 10 ASSEMBLER Programmers

Several contracts are available with starts over the next three to six months.

North East:

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IBM COBOL

Several opportunities for analysts and programmers to resource development projects are available in the north eastern area.

Previous CICS or DL1 experience preferred, but in some cases, these skills can be acquired during the term of the contract.

Please provide information about contract assignments:

North West ☐ North East ☐ Scotland ☐

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These positions will offer successful candidates a first class career in a multi-system computer bureau serving the needs of a large number of companies in a substantial group.

Successful candidates will be required to serve the needs of customers and this will include liaison with systems implementation and also conducting the preliminary studies into additional requirements.

Generous salaries will be negotiated and a first class relocation package is available in appropriate cases.

To apply contact Ivor Norton quoting reference CW/8018 at your nearest office or leave a message on our Ansafone. All enquiries will be treated in the strictest confidence and all messages and enquiries followed up personally.

Candidates must have several years experience including systems analysis, project control and implementation. This could have been in a service bureau or in a time sharing facilities environment.

Applications areas include manufacturing systems, stock control, information retrieval and finance. Candidates should have significant experience in one or more of these areas.

Ivor Norton Management Services Ltd

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IAL Gemini is a new company formed by Cyp Gemini, the largest software group in Europe - and IAL - the British owned market leader in aviation, computer and communications systems and services. IAL Gemini plan to expand their existing customer base which comprises the major financial and industrial clients of Gemini Computer Systems Ltd in the UK. Cyp Gemini Sogen clients in Europe, and IAL customers in the UK, North America and throughout the world. IAL Gemini employs 150 staff from offices in London moving to offices in Harlow

and Manchester (Altrincham), and will have a turnover in 1980 of more than £2½ million. Opportunities exist in the new company for all levels of experienced computer professionals to work in house and on client-based projects in all spheres of computer software and communications developments, including the specific requirements outlined in this advertisement. Benefits include a realistic commencing salary, six monthly reviews, individual wage-based bonus scheme paid quarterly, pension scheme, life insurance and permanent health insurance and other large company benefits.

IAL GEMINI

1. Commercial and Industrial Systems

Experienced programmers and analysts interested in working on real-time computer systems, based on Data General hardware. Should have a knowledge of real time operating systems and Fortran or Cobol on a main micro-computer. Project work, in-house, in Harlow. With opportunity to travel in the UK and North America. London, Contact A.

2. Micro Software Analysts and Programmers

IAL Gemini are working with Data 10 to develop and install a range of commercial software packages based on the successful Syntec 401 range of micro-computers. Experienced Programmers and Analysts with a good knowledge of commercial systems and experience of COBOL are required for software development, support, installation and training in the London and Manchester offices. London and Manchester. Contact B or C.

3. Human Resources/Personnel Software Systems

Optimum use of human resources is becoming widely recognised as of vital importance to UK companies. IAL Gemini is at the forefront of the development and installation of successful personnel systems. Senior Consultants are required to work with clients specifying and implementing InSci system modules and to provide systems training and Manchester. Contact B or C.

4. Commercial and Industrial Systems

A large number of companies use the services of IAL Gemini for a wide variety of interesting and diverse tasks covering all aspects of computing. Projects range from small accounting systems for first-time business users to industrial applications such as real-time process control. All grades of programmers and analysts are required to work in these fields. London and Manchester. Contact B or C.

SALARIES - £4,000 TO £10,000 PER ANNUM

Contact A Phil Benton 01-574 2411
B Per Hovind 01-828 6634
C Gerald Plimley 061 941 1922

or write to
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Career Opportunities in Liverpool for both

PROGRAMMERS £4,800-£6,300
SYSTEMS ANALYSTS £5,300-£7,500

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SUPERB PROSPECTS OF PERSONAL ADVANCEMENT

WIDE RANGE OF MINI AND MAINFRAME PROJECTS

PL1 OR COBOL

As a Data Processing professional, you are naturally concerned that your future in the industry will satisfy your needs for involvement, responsibility and the appropriate rewards. It is difficult to assess from an advertisement, whether or not a job will give you all you require, especially when most tend to be emotive rather than factual. To assist you in assessing this advertisement, you will be treated correctly, as an intelligent adult.

Your questions will be, who? what? and where? and what's in it for me? -- Here are the answers. Our Clients are a National Food Manufacturing Organisation, who are enjoying an increase in the volume of business, not just an increase in turnover. Their divisional computer unit is based in Liverpool and they utilise an IBM 370/145 and 2 x TI 990 minis. They have a network of local and remote terminals and use a wide range of sophisticated software, including ENVIRON TP monitor and TOTAL data base management system.

To enhance existing business applications the Company have a number of major projects to undertake, including market planning and forecasting, purchasing and raw material stocks and distribution. In addition there are a range of other applications required by the users. To ensure that their development commitments are met, they wish to recruit 2 Systems Analysts and 2 Programmers at varying levels of experience. The salary structures for both disciplines are excellent and there is opportunity to advance way above your starting salary.

Programmers -- To be successful in this position you will require a minimum of 18 months PL1 or COBOL experience and be capable of contributing to systems design in a project environment.

Systems Analysts -- In this role you will be expected to lead a project and have at least 18 months systems design experience in a commercial environment, ideally backed by a programming expertise.

All the positions offer excellent prospects of advancement, both technical and personal and the normal benefits associated with a progressive Company e.g. pension scheme, flexitime and paid overtime.

For further details of these excellent positions -- please contact:
Advising Consultant Peter Brown, on
061-833 0427 OR 0706 65628 Evenings and Weekends.

London 01-836 0671 3 Mandeville Place, Wigmores Street, London W1M 5LB
Birmingham 021-236 3781 35-37 Great Charles Street, Queensway, Birmingham B3 3JY
Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA



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SCICON's professionalism and experience allows you to both capitalise on and continue to develop your UK career, whilst working in the Middle East.

The following openings exist for qualified, high-calibre staff who wish to join the Middle-East teams:-

Consultants

c £21,000 - £24,000 +

Candidates will have had a minimum of 7-8 years d.p. experience, with the emphasis on overall systems design, project leadership and control, large machine environment and sound DBMS design experience -- IMS, IDMS, DMS 1100 etc.

Systems Analysts

c £17,500 - £21,000 +

Candidates will preferably have had significant analysis/design experience in at least one major project, plus experience of one of the DBMS systems. A minimum of 3-5 years in d.p. is required, to include sound programming experience.

Programmers

c £16,500 - £19,500 +

Essential qualities required from Programmers in SCICON are the ability to grasp new ideas and techniques quickly, coupled with a sound technical awareness of the systems with which they have been involved. Exposure to both high and low level languages is preferred.

(Quoted remuneration is based on married employees with no children, who are UK householders).

If you feel that you would like to take this opportunity of working in the Middle East for a British company of high standing, phone now for more details, and an accurate estimate of your likely earnings.

Contact: Andy Wright

**JAMES BAKER ASSOCIATES, International Personnel Consultants,
32 Savile Row, London W1. Tel: 01-439 9311.**

Andy Wright

JBA OVERSEAS

Senior Software Designers

S. Germany **c. £20,000 + Benefits**
A specialised group of Senior Designers currently has a number of slots for qualified individuals with extensive design and implementation experience in one of the following areas: multi-processor architecture; system recovery; continuous processing; communications; etc. Unparalleled opportunities for high-level candidates to work on leading-edge design projects, with a major European company.
Contact: Andy Wright

Database Design in Benelux

Salaries neg. to £18,000 + Car + Benefits
Our client has established one of the foremost specialist Database/T.P. Consultancies in the U.K., and is set to do the same in Holland and Belgium. They already have an office in Amsterdam and are running several projects for Dutch clients at this moment. The plans are to expand this area by opening an office in Belgium, where the company already has one project about to get underway, and in continue penetration of the Dutch market. Applications are invited from candidates who have design experience of at least one of the CODASYL dbms systems - e.g. DMS 1100, TOTAL etc., who wish to enter the Consultancy field - if not already working for a Consultancy - and who are keen to live and work in one of the Benelux countries. Full relocation expenses will naturally be provided, plus substantial large company benefits such as company car etc. Relocation back to the U.K. in the medium term - to work for the U.K. based company - is not ruled out.
Contact: Andy Wright

Customer Support Engineers

Italy (Milan) **Nett: £8,000 - £10,000 plus complete relocation**
Our client requires trained and experienced Support Engineers to assist in the preparation of complete installation, maintenance and repair documentation for an impressive range of multi-computer systems and associated data communications networks. Candidates must be reasonably articulate and have a flair for communicating on technical subjects, particularly in the written word. Wonderful permanent job opportunity with excellent working conditions and career prospects.
Contact: Mike Creamer

CICS Specialist

France **c. £18,000**
A French speaking CICS Internal specialist is required to help a major international company implement a series of complex on-line systems in their French d.p. installation. The hardware consists of a new IBM 4301 under DOS/VS, and supports a large SNA network, which is still being developed. Knowledge of a high-level language would also be an advantage, since the appointee will be expected to contribute in several areas of development eventually - including some aspects of the network. **Contact: Mike Creamer**

OEM Market Manager

Amsterdam **fl. 65,000 - fl. 75,000**
A large international company, famous for a product range of high quality technical systems, are now seeking to expand and improve their penetration into the OEM market place. This position will involve marketing responsibility for the OEM customer base in a selected market segment. Candidates should have a demonstrated record of sales or marketing success in the computer/terminal industry and a good knowledge of display technologies. A background or education in electronics, initiative, and a business orientated attitude are essential. Reasonable amounts of travel in Europe will be required.
Contact: Mike Creamer

Communications Consultants

S. Germany **c. £18,000 +**
A new division of a highly regarded Consultancy is shortly to be established in Southern Germany, in specialise in Communications software development and Network planning, design and implementation. If you have experience in either of these fields which you feel could be of value, and you wish to consider spending some time in Europe.
Contact: Andy Wright

COBOL/BAL Programmers

Central Holland **start at £16,000 p.a.**
We have been asked to recruit a number of Programmers and Programmer/Analysts for a major new project in Central Holland. Each candidate must have a minimum of 2 years COBOL and BAL gained in a 370 environment, whilst some design experience would be extremely valuable. The project involves the redesign of several separate systems currently running on a variety of 370 machines, to produce one standard system capable of being implemented on new UNIVAC hardware - e.g. 1160's etc. A lucrative, career-building opportunity for those wishing to break into the European market place.
Contact: Andy Wright

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311.

contracts

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Please provide information about contracts in the Midlands.

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Mail (no stamp) to FREEPOST, COMPUTER PEOPLE MIDLANDS,
Alpha Tower, Birmingham, B1 1BR

System Designers

London **Circa £12,000**

For a major, international supplier of business computers which is offering two outstanding software professionals the opportunity to take charge of commercial application development for a new real-time minicomputer.

The essential need is for extensive experience in the design and installation of interactive application systems together with sound knowledge of a broad range of commercial applications such as Order Processing, Financial and Stock Accounting. The executives appointed will be required to work closely with a software house and ensure that their application objectives and system architecture are successfully converted into working interactive commercial packages which have wide appeal to business and are easily operated by non-data processing personnel.

Please write in complete confidence to D. May, quoting ref. CW/AT.

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SE1 0AA

Department of
Mathematical Sciences &
Computing

**SENIOR LECTURER/
LECTURER II
IN COMPUTING**

(Ref: X8)

Applications are invited from those able to offer expertise in one or more of: Problem Solving & Programming Systems, Software, Information Management Systems, Computer Graphics, Commercial Programming, Systems Analysis, Computers in Education.

Salary: (Subject to review on 1st Jan 1980) £6016-£8799 inclusive of Inner London Allowance.

Further particulars and application form from: The Staffing Officer, Polytechnic of the South Bank, Borough Road, London SE1 0AA.

EDP PROJECT LEADER FOR NIGERIA

A. G. LEVENTIS & CO. (NIGERIA) LTD.

We have an opening for a Project Leader to work on systems for a new Control Data installation in Lagos.

Responsibilities will be for the development and implementation of major computer applications including Stock Control and Accounting areas. The successful candidate will be required to lead Systems and Programming staff. Applicants should have at least 6 years' EDP experience and must have a record of previous responsibility for the development of similar applications.

A salary of Naira 20,000 (circa £16,000) is envisaged and terms of service include 2 months' home leave after 12 months' service. Free furnished housing and other fringe benefits.

Apply in confidence to:

The Personnel Department
A. G. LEVENTIS & CO. (NIGERIA) LTD.
West Africa House, Hanger Lane
Ealing, London W5 3QR

Have you spearheaded got the thrust to Britain's computer peripherals industry!

Sales Professionals

An unequalled opportunity for people with exceptionally successful track records to cash in on their skills in selling to OEM's and end-users.

Applicants should be experienced in selling Disc Products, Printers or Media.

International Accounts Manager

This is a challenge for a Sales Manager of the highest calibre with the ability to sell at both boardroom and technical levels with selected OEM accounts in Europe. Knowledge of French or German would be highly desirable.

Sales/Marketing Manager (Printers)

Our client considers that there are probably only half a dozen people in the country with the Printer experience needed to capitalise on the investment made in a totally new factory.

The successful applicant will be set targets and will have to be ambitious for the rewards that meeting such a challenge can bring.

A company car is provided for all positions

*With so much to offer,
Why is our client being so secretive?*

Because the company expects a big response, and in view of the time-scale involved, we have been asked to recommend a team - not just individuals - who will form the nucleus of Britain's peripherals industry. To make sure you're in at the start, ring us between 8.30 a.m. and 8.00 p.m., Monday to Friday, to arrange a preliminary interview. Please quote reference No. CW/DWW/002

**Insight Marketing
& Personnel Consultants Ltd.,**
72-75 Marylebone High Street,
London W1M 4AJ,
Tel: 01-486 5644

All the above positions are open to both men and women.



JBA**Chief Programmer****Suffolk c. £8,000**

A distinguished and well established manufacturing organisation, located in a very attractive rural area, are seeking an experienced Senior Programmer or Chief Programmer to be responsible for all aspects of applications programming and systems software. Candidates will be fluent in both PLAN and COBOL, with several years 1900 and/or 2903/2904 experience, including some management. A number of new projects are in progress and there are firm plans for additional hardware and software development.

Contact: Bernard Kiernan

Real-Time Programmers**Sussex c. £8,000**

JBA has been retained to recruit an experienced Programmer for a specific project, which is an advanced and innovative micro-based satellite navigational system. Candidates, ideally graduates, must have a predominantly software orientated background, with experience of high level languages, CORAL, FORTRAN or ALGOL are of particular interest. Experience of hardware development is not required although would be obviously extremely valuable. The company is a well established and progressive organisation, with a deserved reputation as a world leader in the design and manufacture of communications systems. So an absorbing career is offered.

Contact: Margaret Stevens

Analyst/Programmer**London up to £8,000**

Our client, a large international trading and banking organisation, has a vacancy for an Analyst/Programmer to join a small team developing commercial systems on HP 3000.

Applicants should have at least three years experience of programming and design in commercial applications. Knowledge of real-time, communications and database would be an advantage.

Excellent salary, opportunity and benefits.

Contact: Jim Baker

Senior Programmers**MORTGAGE SUBSIDY****Hampshire up to £7,500 + many benefits**

Our Hampshire client, undertaking advanced development work on a large real-time database system, now need to strengthen their team on this project with additional senior staff. The system is being built around a powerful Burroughs B6800 machine and incorporates a DMS 2 database with a multi-terminal real-time network.

Candidates must be mature, senior individuals with several years programming experience on real-time and/or database development projects. Leadership qualities and a natural ability to readily conform to strict standards will be sought. Wonderful opportunity for career advancement and a truly magnificent employment package.

Contact: Mike Creamer

Analyst/Programmers**Thames Valley negotiable to £7,000**

Our Client, well-known and respected in the electronics field, are involved in new ventures in data processing, including the development of internal (commercial) systems for implementation and marketing outside the company. Two people are required to play a major role in those ventures. Specific hardware or language knowledge is not important, but a minimum of one years programming is necessary. For one position, a knowledge of Assembler (any) would be useful.

Excellent opportunity to join an established and growing company, where enthusiasm and hard work is rewarded.

Contact: Bernard Kiernan

Programmers**Berkshire up to £7,000**

A well established British company specialising in industrial systems has opportunities for Programmers to join the expanding development team. Candidates, preferably graduates with at least twelve months programming, should have experience of minicomputers in technical, industrial or process control applications.

Large company benefits including relocation.

Contact: Jim Baker

Systems Analysts**Nottingham c. £6,300**

A major and diverse company requires SYSTEMS ANALYSTS to assist in the development of a range of interesting commercial applications. In addition to systems experience applicants should have a good education and at least 2 years programming experience preferably in an IBM mainframe environment.

Contact: Bev Stevens

Operators - IBM Tech. Support**U.K. & Europe****Salaries Neg.**

Our client, a large U.S.A. software package development and marketing organisation, seek informed and experienced IBM Operators who have the immediate potential for Technical Support Work. The work will involve being based in the U.K. or in Europe with considerable travel.

Applicants must be able to prove in-depth knowledge of IBM systems software operation, preferably DOS, and have if possible Assembler programming ability.

Contact: Mike Creamer

JAMES BAKER ASSOCIATES,
International Personnel Consultants,
32 Savile Row, London W1.
Tel: 01-439 9311.

**Manager-
E.D.P. Services****Northern Home Counties c.£10,500+Car**

This new appointment, reporting to the Finance Director, is based at the head office of the key UK subsidiary of a major international group and which has multi-plant operations.

The overall task will be to co-ordinate the operation of E.D.P. services within the UK company and develop policies and procedures to improve management controls. Initially, there will be emphasis on replacing the existing VRC systems and introducing HP 3000 SERIES 30 installations including an integrated sales order, production control, accounting and statistical system.

The successful candidate will have a record of achievement in this field, including systems design, and preferably a knowledge of programming in COBOL or BASIC. The job entails reasonable travel to all parts of the UK and occasionally abroad. There is a highly competitive compensation package and relocation assistance is available.

Please telephone (01-629 1844 at any time) or write - in confidence - in the first instance for a personal history form. B. C. Oliver ref. FY.1558.

This appointment is open to men and women.

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University of London: The London
School of Economics
Programme in Methodology,
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Econometrics
Applications are invited for the post of
**RESEARCH OFFICER/
RESEARCH ASSISTANT**

In the above SSRC sponsored research programme, the person appointed will be one of a team working under the overall direction of Professor J. O. Berger and Professor G. F. Hendry. Candidates should have a background in computer programming and/or econometrics. Candidates whose first degree is in Statistics or Mathematics will also be considered. The main duties of the successful applicant will be developing programmes for handling data systems and models and for carrying out econometric research. It is hoped to make an appointment as soon as possible. It will be for the period to 30 September 1982 on the salary scale for Research Officers of £4785 to £7005 p.a. (to be confirmed); plus £740 p.a. London Allowance, or for Research Assistants of £2885 to £4882 p.a. plus £740 p.a. London Allowance. It is essential that the candidate has a good knowledge of the English language. Consideration will be given to qualifications, age and experience. Applications by 14 March 1980 to the Administrative Officer, Room 11.810, The London School of Economics, Houghton Street, London WC2A 2AE, from whom application forms are available on receipt of a stamped addressed envelope.

**ANALYST/
PROGRAMMER****c £7,000 South Harrow**

Pioneer Concrete (Holdings) Limited is a multi-national Company supplying materials to the Construction Industry. We have installed a Honeywell 62/50 computer and a move into distributed systems is envisaged in the near future.

The successful applicant will be involved in the design and programming of new systems, as well as some maintenance on existing systems. A sound knowledge of COBOL is essential and a knowledge of Honeywell Level 62 GCOS would be an advantage.

Applicants should be willing to work with a minimum of supervision and have the ability to liaise with users at all levels.

Contact Roger Marquet on 01-884 8811 or write to:

PIONEER
U.K. Systems Manager
Pioneer Concrete (Holdings) Ltd
Pioneer House, 55/56, Northold Road
South Harrow, Middlesex.

CLASSIFIED COPY

All classified copy should reach our offices no later than 3.30 p.m. on the Monday preceding Thursday's publication.

If complete artwork is supplied 11 a.m. on a Tuesday.
Ring Ray Kelly for further details on 01-261 8018.

It's all systems go at Hambro Life!

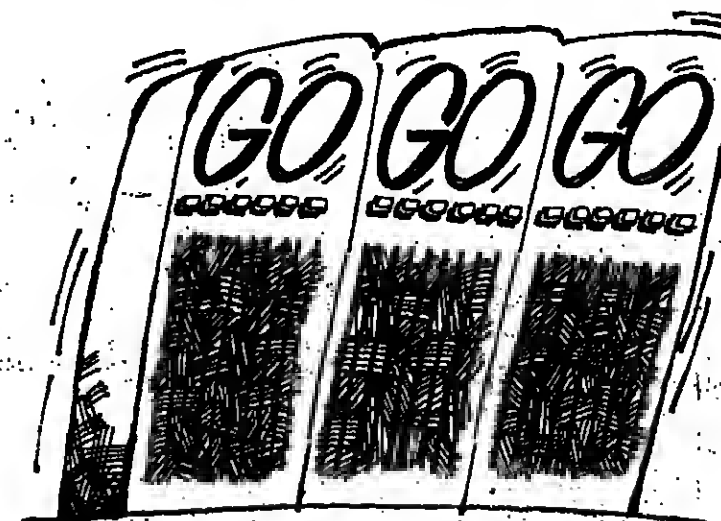
Computer systems are central to Hambro Life's phenomenal growth. In less than 9 years we've become the UK's biggest life office specialising in unit-linked assurance. (Our business grew by 32% last year!) Such a rate of growth has been made possible only by the most imaginative use of computerised systems to speed up new product introduction, cut down policy processing time, and create an exceptionally fast and efficient administration.

Accelerating growth means making large-scale changes to all our major systems, including the development of a completely new life system. All development depends heavily on new technology - including data base, on-line systems and word processing.

Our next generation of systems is producing an exciting work load and opportunities for rewarding, personal growth at the centre of one of the UK's most successful companies.

**Senior Systems Consultants
to £13,200 + car****Consultants to £11,500 + car**

These jobs put you firmly in the front line of our business management, sharing responsibility for wide-ranging business decisions. You need to be that rare breed of analyst: part consultant, part entrepreneur but above all a practical problem solver. The ideal candidate should be a graduate and under 35; excel in all the systems skills; have at least 5 years' large scale systems experience, including a proven record of successful implementations; be currently active in consultancy or project leading.

**Senior Controls Consultant
to £13,200 + car**

We place great emphasis on the importance of Controls in systems development. In 1980 we want to extend the role of our Controls group to cover all data processing controls, and we need an experienced Controls professional to head up this new group. General requirements are as for the previous jobs, but also include a comprehensive knowledge of Controls theory, technique and successful implementation.

Systems Analysts to £10,600

We need Analysts in search of the experience and rewards to match their potential. Ideally you should be a graduate, under 30, and have at least 2 years' systems experience, including at least one successful major systems implementation.

Realistic salary levels are just one aspect of a whole Company philosophy which you'll find refreshingly different. We're young, businesslike and work hard to high standards.

Our remuneration package is first class - with non-contributory pension, free life cover, BUPA, productivity bonus, profit sharing, and generous assistance with moving to Wiltshire (including the guarantee of a mortgage).

For our comprehensive booklet and an application form, contact: Liz Gibney, Hambro Life Assurance Limited, Hambro Life House, Swindon SN1 1EL. (Telephone 0793-27812 24-hr answering service - reverse charges during office hours.) or our Senior systems people will be pleased to meet you informally and talk shop at any time between 1 pm and 9 pm at our open days:

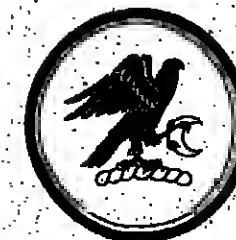
Manchester
Portland Hotel, Piccadilly Gardens, Monday 18 February.

Birmingham
Holiday Inn, ATV Centre, Monday 25 February.

London
Cumberland Hotel, Marble Arch, Tuesday 26 February.

Bristol
Holiday Inn, Lower Castle Street, Monday 3 March.

We look forward to seeing or hearing from you.

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BRIMINGHAM, ABERDEEN, GLASGOW, LEEDS, LONDON, MANCHESTER, NEWCASTLE and SHEFFIELD

Data Processing Manager

Merseyside, to £12,000 + car

This excellent opportunity is with a major engineering company, part of a well known US Group and acknowledged UK leaders in their particular area of capital equipment, involving design, manufacture, installation and after sales servicing. The need is for a 'well rounded' manager, aged 30-35, educated to degree level who can demonstrate outstanding systems and D.P. experience gained in a variety of environments. Excellent communication skills and commercial understanding are essential. You will spearhead the introduction of the sophisticated IBM 4341 and associated hardware and software which the Company has recently installed. This exciting update will result in the D.P. team being the focal point of an exercise which is at the technological forefront of D.P. systems development. As well as being the technical expert leading and motivating a team of c50 staff through the departmental managers and controlling major expense budgets, you must also be able to take your place of senior management level discussions and exert a strong personal influence over a wide variety of user departments. The comprehensive remuneration package includes assistance with relocation costs.

D.N. Chiossy, Ref: 23004/CW. Male or female candidates should telephone in confidence for a Personal History Form to: LONDON: 01-734 6882, Sutherland House, 50 Argyll Street, W1E 6EZ.

Is your knowledge of database worth around £9,000 pa?

Rank Xerox are in the process of developing a major new system to be implemented throughout the operating companies in 13 European countries. The system is based on large IBM mainframe equipment and PL/1 mini-computers and utilises an advanced database design.

To complete the Database Support Group we are looking for an additional person with good experience in database techniques, relevant to IBM equipment.

If you are an

Analyst or Programmer

with this knowledge and with the desire to specialise in database design and support we would like to hear from you.

We offer a salary up to £9,000 together with BUPA and an attractive benefits package and the opportunity to work on an advanced system in a highly progressive and ambitious environment. We are situated in Uxbridge, opposite the Metropolitan Underground station and within easy travelling distance from the west of London and the surrounding countryside.

For further details please telephone Ari Heneghalla on Uxbridge 52523 or write for an application form to: Alan Howell, Senior Personnel Officer, Rank Xerox (UK) Ltd., Middlesex House, 4 Mercer Walk, Uxbridge, Middlesex.

RANK XEROX

The College is installing a new ICL 2804 computer, for educational purposes. The installation will be based at Bradford College but will service the needs of all the Bradford Metropolitan District Colleges.

Applicants are invited, therefore, for the following posts:

COMPUTER OPERATOR

Applicants should be experienced in the operation of ICL equipment, which is to be used in a batch of time-sharing service.

The salary will be in accordance with the NJC Conditions of Service, Scale 12. — £3886-£3963.

DATA PREPARATION OPERATOR

Applicants should be experienced in data preparation work, mainly with punched card equipment.

The salary will be in accordance with the NJC Conditions of Service, Machine Operator (Intermediate) Scale — £1892-£3188.

Application forms and further particulars are available from the Staffing Officer, Bradford College, Great Horton Road, Bradford BD7 1AY.

And completed forms should be returned so as to reach him not later than 27 February, 1980.

Bradford College

NEWCASTLE UPON TYNE POLYTECHNIC
Computer Unit

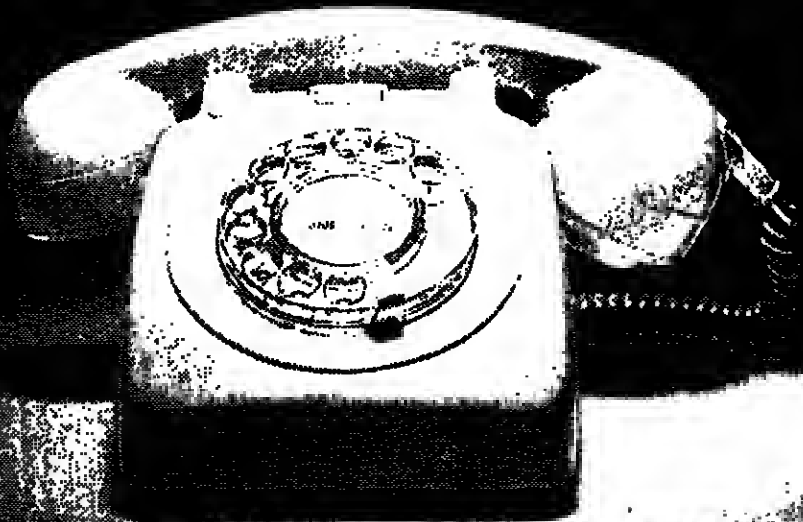
OPERATIONS MANAGER (P01 H-8)

To head the Operations and Data Processing Services Division. The successful applicant will be responsible for managing the day-to-day computing services for teaching, research and administrative work in the Polytechnic. The Computer Unit operates NOVA and Heli computers supporting 70 terminals and is directly linked to an IBM 370/188 computer. Candidates should have a sound practical computing background and several years experience of computers.

NJC Salary and Conditions: P01 H-8 £5718-£7602 per annum. For further details and application form, returnable by 28th February 1980, please call our 24 hour telephone answering service (0832 33139) or send a stamped, addressed envelope to the Personnel Officer, Newcastle upon Tyne Polytechnic, Eldon Building, Eldon Place, Newcastle upon Tyne, NE1 8ST.

COMPUTER PROFESSIONALS

How much difference will one phone call make to your career?



Dial Portsmouth (0705) 370911 and ask for John Noon, the GBG Systems Manager. He and his managers will be waiting to talk to you between 8.30 am and 6.30 pm any day from Monday 18th February to Friday, 22nd February.

We're looking for ambitious men and women at all levels to join our vigorous General Business Group, working on a range of IBM products. These include real time applications development using 3033, IMS DB/DC, PL/1 and TSO to distributed data processing using System/34, office systems, ICF and RPG II.

We'd like to hear from you, no matter what stage you have reached in your career. From senior analysts or programmers with several years' proven expertise to trained programmers with modest commercial experience but the potential to develop rapidly.

In addition we need people with operational experience for the Production Support Group, responsible for machine

fixing, output distribution and user liaison.

Whatever your background, we will offer you a salary which will amply reflect your qualifications and experience, growing at the same pace as your career.

A generous benefits package includes flexible working hours and relocation expenses where appropriate. We are situated in an attractive part of the South Coast, and the easily-accessible sporting and recreational facilities are an added advantage.

Find out more about us — and let us know what you're looking for — by phoning Portsmouth (0705) 370911, reversing the charges at the times shown. Alternatively, write for an application form to: Mrs. Jennifer Seddon, IBM United Kingdom Limited, 28 The Quadrant, Richmond, Surrey, TW9 1BW.

IBM

SALES MANAGER COMPUTER SERVICES £15,000 P.A. + CAR

One of the fastest growing computer services companies in the Midlands and North West requires a Sales Manager for each respective area. Donoghue Information Systems Limited is a well established, financially stable expanding operation. Offices in Birmingham, Manchester and Dublin provide software, interactive bureau and turnkey mini computer solutions to business problems. We offer the excitement of a growing organisation plus the opportunity to make a real contribution to the success of the company. The rewards in job satisfaction and financial terms are high for those prepared to become truly involved. We seek the following:

Age 30 plus
Successful record of selling computer systems
Experience in commercial business systems
Knowledge of the workings of a computer services company
Positions are open to both male and female applicants. Please, reply giving relevant details of age, experience, education and present salary to:

Donoghue, Chairman
DONOGHUE INFORMATION SYSTEMS LIMITED
Shenstone Drive, Aldridge
West Midlands WS9 6TP

UNIVERSITY OF GLASGOW
DEPARTMENT OF COMMUNITY MEDICINE

STATISTICAL APPLICATIONS PROGRAMMER

Applications are invited for the above post in the Department of Community Medicine, Ruchill Hospital, Glasgow.

The department is involved in long-term projects which give rise to large, and sometimes complex, sets of data. Particular interests of the department include the monitoring of disease, evaluation of health programmes and evaluation of health care. Particular occupational groups. There is also a long-term interest in the application of statistical inference and decision theory to clinical medicine which has given rise to a number of projects. The management of these data sets and their analysis — either by program packages or by ad hoc programs — is the main responsibility of this post. The successful applicant would be expected to teach elementary principles of computing to medical undergraduates and postgraduate students, and to assist in collaborative projects as they arise.

Some experience in survey design, data handling and in applying statistics is essential, as is a wide experience in programming. The successful applicant will be encouraged to initiate, select and follow them through in publications.

Further information may be obtained from Professor G. L. Stewart, University Department of Community Medicine, Ruchill Hospital, Glasgow G20 9NS (041-848 7120, Ext. 276).

Applications (3 copies), with the names and addresses of three referees, should be lodged with the Secretary of the University Court (Room 18), University of Glasgow, Glasgow G2 7QU, on or before 14th March, 1980.

In reply please quote Ref. No. 489 IE.

Opportunities in Database Management/Software Support



with

MICHELIN at **STOKE-ON-TRENT**

THE COMPANY

Michelin is Europe's leading radial tyre manufacturer with United Kingdom headquarters at Stoke-on-Trent in Staffordshire. The company is dedicated to the effective use of computer systems and operates dual Honeywell 66/20 computers at the U.K. Management Services Centre in Stoke, supporting extensive Honeywell Level 6 and Ventek Datapoint mini computer networks throughout the country.

THE LOCATION

Stoke-on-Trent is situated in North Staffordshire within easy reach of many areas of natural beauty such as North Wales, Derbyshire and the Peak District. The city has many buildings of historic interest but still offers excellent modern shopping facilities. Housing is available at reasonable prices and many parts of rural Cheshire and Shropshire are within easy commuting distance.

THE POSITIONS

The Company plans to enhance its computer facilities considerably over the next twelve months, and in addition to upgrading the hardware, DM IV software will be introduced.

Over the past few years, considerable experience has been gained in the use, development and enhancement of Honeywell software. In order to continue this

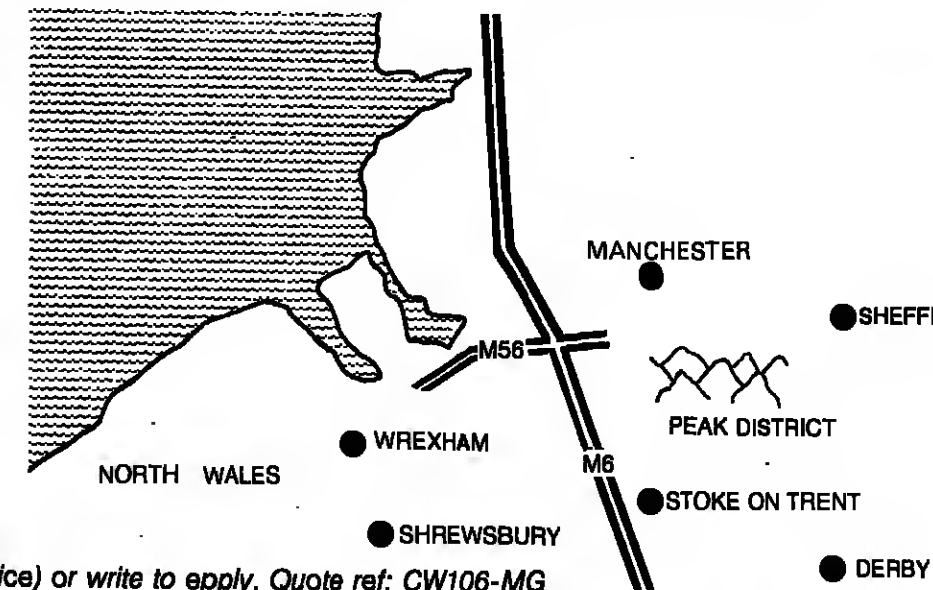
Salaries up to £8,500 p.a.

work and move forwards with the major new developments currently under way, there is a need to recruit two further specialists.

Candidates are likely to come from either an Analyst/Programmer or Systems Programmer background — the actual hardware experience is of less importance than a record of success in their career to date. A knowledge of Database, Transaction Processing or mini computer systems would be an advantage.

THE PACKAGE

Salaries will be commensurate with experience and potential and are unlikely to be a problem for the right people. In addition the company offers excellent conditions and fringe benefits together with relocation assistance where appropriate.



Please telephone (24 hour answer service) or write to apply. Quote ref: CW106-MG

CAPP ASSOCIATES
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LONDON and MANCHESTER

Faulkner House, Faulkner Street, MANCHESTER M1 4YD

SOMETHING SPECIAL FOR PROGRAMMERS

CENTRAL LONDON (up to £8750)

There are plenty of run-of-the-mill jobs about, some interesting jobs which are badly paid, and some highly-paid jobs which are nevertheless tedious.

This opportunity is SPECIAL because you will have the chance of learning sophisticated methods (including database and communications) on a large mainframe, using on-line program development techniques, and at the same time enjoy a good earnings package, with sound career prospects.

We are recruiting for clients, a well-organised London installation, and all the work is on-site. We would like to hear from programmers with at least 1½ years' practical experience (for less senior positions). Ideally including COBOL. For experienced programmers who have used other languages, retraining will be provided. Team leadership ability will be required for more senior candidates.

Please ring us in confidence for a talk, quoting ref 238CW or leave a message on our answering machine after hours and we will contact you.



EDP SYSTEMS 01.637
52-53 Margaret St. London W1N 7FF 5796

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All classified copy should reach our offices no later than 3.30 p.m. on the Monday preceding Thursday's publication. It complete artwork is supplied, 11 a.m. on a Tuesday. Ring: Ray Kelly for further details on 01-281 8018.

Opportunities in Bavaria.

**ANALYSTS AND PROGRAMMERS
IBM 370/158-COMPATIBLE SYSTEMS:**

Over the last ten years National Semiconductor has expanded to become one of the biggest electronic component manufacturers in the world.

We employ 30,000 people who design, develop, manufacture and market products from microprocessors to large computer systems.

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* with proven experience in the following fields:
Product Distribution and Inventory Management

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You will liaise directly with the end-user, defining the present and future requirements, designing and implementing the system.

COBOL PROGRAMMERS

with 2 years experience and the following qualifications are invited to apply:

* Proven knowledge of OS/VS/3CL
* TSO experience, though not essential, would prove a decided advantage.
* The ability to work on your own.

Excellent salaries and a generous benefits programme are offered. We will relocate you and assist you in finding a home. (Initial interviews will be held in London in early December) Phone 01049-8141-103213
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WEST GERMANY



National Semiconductor

Jobs of National Importance

You are a Specialist in PRODUCTION CONTROL SYSTEMS...

... a professional to your fingertips, and have achieved a degree of success in your career so far.

You are also frustrated. Things aren't moving quickly enough. You just cannot use or even develop that expertise to its full advantage.

We aim to change all that. We have developed a highly successful range of system products which include IMPCON — a sophisticated real time production system which addresses all the classic applications within the manufacturing industry. We now expect

to double the turnover of the Company with sales of IMPCON during 1980.

Which means that we need people to join our team as Product Support Managers. People looking for a high degree of job interest, and a total personal involvement from conception of a project through to post sales support including enhancement and client consultancy. This could take you all over the UK and possibly abroad.

Move quickly. Contact: Morris Hogg, on 01-486 0737/0345 or write to him at the address below:

Our starting salaries will range up to £9000.

Computer Systems Development (CSD) Limited.

75, MARYLEBONE HIGH STREET, LONDON, W1M 4AJ.

OVERSEAS CONTAINERS LIMITED, a world leader in container transportation, has just completed a decade of impressive growth.

Consider these facts:-

★ 1970 .. 1 IBM 360/30 (DOS) Mainframe B2 D.P. Personnel
★ 1975 .. 1 IBM 370/145 (DOS/VS) Mainframe 133 D.P. Personnel
★ 1980 .. 2 IBM 370/155 (MVS) Mainframe 250 D.P. Personnel
The 1980's promise to be similarly exciting: plans laid include the development of data-oriented systems using database and data dictionary techniques, which will augment sophisticated (and substantial) on line and batch systems currently in use.

Consequently a number of demanding career opportunities exist within the Management Services Division.

► **Analysts to £8,700 p.a.**

You have 2-3 years' experience with commercial or financial systems. This is a challenging opportunity for gaining exposure, in a professional environment, to TP and Database techniques.

► **Senior Programmers c.£8,000 p.a.**

You have 3-4 years' exposure which includes supervisory experience and you are fluent in PL/1 and/or BAL. For the career-minded, these openings represent marvellous opportunities, working in a busy, happy team environment.

► **Programmers c. £7,000**

You have 2-3 years' experience with BAL and/or PL/1. OCL has excellent, carefully-tailored training schemes, which will allow rapid expansion of your technical repertoire. TSO, CICS/VS, IDMS and MVS training will be given.

► Benefits offered include those expected from a major Company: flexible working hours, interest free season ticket loans, subsidised staff restaurant and an excellent Pension and Life Assurance scheme.



HOW TO APPLY: Send a brief C.V. to Dilog quoting ref. C0281 or telephone George Searl on 01-638 0036. DILOG LIMITED, Throgmorton House, 15 Copthall Avenue, London EC2M 5TP.



SOUTH AFRICA £4,000 to £11,000

Analysts/Programmers/Analyst/Programmers

Barlow Computer Services (Pty) Ltd is the internal bureau for Barlow Rand—one of South Africa's largest group of companies. We have experienced tremendous growth (some 33 0/0 p.a. over the last five years) and plan to keep up this rate at least over the next five years. We are currently building one of the most sophisticated data networks in the country linking all our installations (current and planned).

We would prefer applicants with IBM experience, but are more concerned about employing computer professionals with initiative and ability. Promotion opportunities are excellent, whether you are technically or managerially orientated.

Systems Analysts—R12000—R20000 The range of applications is diverse. Experience using on-line and data base processing would be an advantage, but more important is proven analytical calibre. The completion of at least one significant project from start to finish is essential.

Analyst/Programmers—R10000—R17000 These positions will suit candidates who are moving from programming to analysis. The preferred language is Cobol.

Programmers—R7000—R12000 A minimum of two years Cobol experience is required. Working in project teams, programmers are given regular training in the latest techniques and the opportunity to develop particular interests.

Salaries are fully competitive with local levels and will enable candidates to enjoy the high living standards associated with South Africa. The fringe benefits are good and assistance with relocation will be provided.

Initial interviews will be conducted on our behalf by CHAD STOLPER of PRESCOT COMPUTERS. Please telephone him on (01) 434 2698/9 or, if you prefer, write to him at: Prescott Computers Limited, 43 Conduit Street, London W1R 9FB.

DATEC

Pty. Ltd.

Computer Services

Careers in Australia for Programmers, Analysts and Project Leaders Salary to (Aust.) \$24,000

Datec is Australia's largest privately-owned software house and vacancies are available in all states. We have well-established consulting, programming, facilities management, minicomputer and software product divisions. Analysts and Programmers should have a minimum of 3 years' programming experience on recognised mainframe or mini. Specialists are required in IBM Techniques — IMS, CICS and 4300 series particularly. Please send handwritten summaries to Datec's founder and Managing Director, Mr. Harry Douglas, who will be in our London office at 45 Albemarle Street, London SW1X 3FE from 21st February for two weeks. Don't forget to include both day and evening telephone numbers and indicate the best time for us to telephone you.

BOX Nos.

Box number replies should be addressed to:

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c/o Computer
Weekly
Dorset House
Stamford Street
London SE1 8LU

GLASGOW COLLEGE OF TECHNOLOGY

The Glasgow College of Technology, a major polytechnic institution of higher education, invites applications for the following post:

COMPUTER STUDIES— LECTURER 'A'

Suitably qualified and experienced person with a special interest in either COMPUTER SCIENCE or SYSTEMS ANALYSIS AND DESIGN.

SALARY SCALE:

LECTURER 'A' £4,484-£7,821 (BAR) — £8,397

Placement on the salary scale will be given for relevant experience. Forms of application and further particulars can be obtained from the college concerned to whom completed applications should be returned not later than 29th February, 1980. Edward Miller, Director of Education, STRATHGORD REGIONAL COUNCIL.

Operations Support

Location: Sheffield

Opportunities exist within our Operations Central Support Group in Sheffield for staff to join a team providing a support service for the Bank's IBM Computer Centres.

Successful applicants should possess a sound knowledge of computer operations, J.C.L. and utilities, which will have been gained in a medium to large computer centre with teleprocessing links using any of the following:-

370 or 3030 series hardware
OS/VS1
MVS and TSO
TCAM and/or VTAM
C.I.C.S.

Salary will be dependent on age and experience and will be within the range £4900-£6000. There is an excellent non-contributory pension scheme together with all the other fringe benefits associated with a major clearing Bank.

Applications giving details of age, qualifications, experience and present salary should be addressed to:-
Computer Operations Personnel Manager,
Midland Bank Limited,
Griffin House,
Pennine Centre,
Silver Street Head,
Sheffield S1 3GG.



**Midland
Bank**

PROGRAMMERS

London IBM Cobol/PL1/Mark IV

Telephone Roger Barnes

on 01-828 4200

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Systems Analyst

You'll be involved in the exciting new project we're currently undertaking in manufacturing to re-develop major portions of our Production Control Systems using IBM COPICS packages, five of which are already implemented for a new product development. And

we've got an IBM B100 on order for 1980 for use in the re-development of our shop floor data collection system.

Software Systems Programmer

You will be installing and maintaining our operating systems — DOS/VS and VM — and teleprocessing software — CICS/VS and VTAM. Future projects include system generation for the new IBM B100 and IBM 4341 we'll be installing later in the year, operating under VM/DOS/VSE. At least 12 months' experience of systems programming and knowledge of DOS/VS are essential.

Application Programmers

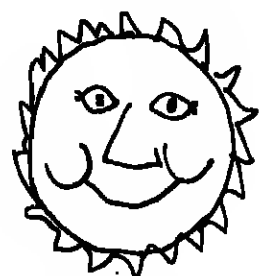
We need two more with a year's COBOL experience to join our team of 10 working on a wide range of manufacturing, financial and marketing systems. You'll have the opportunity to develop your software expertise substantially, working with GIS, OL, CICS, DBOMP, CULPIT, APL, ASSEMBLER, SELURD, SELCOPY, EPAT and SPMOL.

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Please write with full career details to John Heath, ITT Business Systems, Hollingbury, Brighton BN1 8AL or telephone Brighton 607111. Ext. 3623 for an application form.

ITT Business Systems





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The Pilkington Group, one of the world's leading flat glass manufacturers, has recently invested £23 million in a major expansion programme at its South African operation which is based at Springs, near Johannesburg. The Pilkington Group in South Africa employs over 2000 people and is recognised as being one of the country's finest employers. Due to expansion and the continuing growth of our Data Processing Department, one of the world's largest glass manufacturers require experienced computer personnel for their Springs based operation. The company operates an ICL 2904 computer and its application has extended into all facets of the organisation. The incumbents will be exposed to a very varied work routine.

Systems Analyst/Project Leader

The successful applicant will have at least 6 years' programming and system analysis experience. A thorough knowledge of Cobol and ICL software would be a decided advantage. He should be able to communicate at all levels of the organisation.

Programmer

The ideal candidate will have had at least 2 years' Cobol experience. In addition knowledge of RPG, although not essential, would be a decided advantage.

We offer:

- A competitive starting salary including Christmas and holiday bonus.
- An excellent further study assistance scheme plus assistance for your dependents' education.
- Recreation club facilities.
- Relocation expenses.
- A fringe package as only offered by a company of our international standing.

For an appointment to interview please contact Head of Personnel Services, Pilkington Brothers South Africa (Pty) Ltd, P.O. Box 111, Springs, 1560, Transvaal, South Africa, enclosing full details of work history to date, marital status and address and telephone numbers at which you can be contacted. Initial interviews will be held in the U.K.



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PROGRAMMERS

£4858-£6155

The Executive is a user of the West Yorkshire Joint Computer Committee's IBM 370/158 operating under OS/VS1. Processing of the Executive's systems is from several remote job entry terminals, and interactive terminals are used for program development.

PROGRAMMERS

Two years' programming experience principally in COBOL. Knowledge of OS/VS1 would be an advantage, although where necessary education and training in IBM systems will be provided.

The Executive offer the following benefits: modern working conditions, canteen facilities, 32 days paid holiday, free travel and a good pension scheme.

The Location: Wakefield - Cathedral City of West Yorkshire close to M1 and M62 within easy reach of National Park and East Coast Resorts. Assistance with relocation expenses in appropriate cases.

Application forms are available from the Personnel Section, W.Y.P.T.E., Metro House, West Parade, Wakefield WF1 1NS (Tel: 0024 78234 ext 284) to be returned no later than 25th February, 1980.

UNIVERSITY COLLEGE
OF SWANSEA

Lecturer

Applications are invited from suitably qualified persons for the vacancy of Lecturer in the Department of Electrical and Electronic Engineering. Applicants should preferably have a high degree and industrial experience, with research interests in the field of Systems, or the Processing of Signals, in the fields of Communication, Control or Instrumentation. Experience in Digital Methods will be particularly advantageous.

The appointment will be made at the level of £15,000-£16,000 per annum plus US\$10,000 benefits. Further particulars and application forms (2 copies) may be obtained from the Personnel Officer, University College of Swansea, Singleton Park, Swansea SA2 8PP, to whom they should be returned by Friday, March 7, 1980.

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with Cold/Defence background to take on a variety of projects in the defence area. Applications to J.A. Davies, D.P. Manager.

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JBA

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c. £8,000

A distinguished and well established manufacturing organisation, located in a very attractive rural area, are seeking an experienced Senior Programmer or Chief Programmer to be responsible for all aspects of applications programming and systems software. Candidates will be fluent in both PLAN and COBOL, with several years 1900 and/or 2903/2904 experience, including some mainframe management. A number of new projects are in progress and the team plans for additional hardware and software development.

Contact: Bernard Kiernan

Real-Time Programmers

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c. £8,000

JBA has been retained to recruit an experienced Programmer for a specific project, which is an advanced and innovative micro-based satellite navigation system. Candidates, ideally graduates, must have a predominantly software oriented background, with experience of high level languages, FORTRAN, FORTRAN or ALGOL are of particular interest. Experience of hardware development is not required although would be obviously extremely valuable. The company is a well established and progressive organisation, with a deserved reputation as a world leader in the design and manufacture of communications systems. So an absorbing career is offered.

Contact: Margaret Stevens

Analyst/Programmer

London

up to £8,000

Our client, a large international trading and banking organisation, has a vacancy for an Analyst Programmer to join a small team developing commercial systems on HP 3000.

Applicants should have at least three years experience of programming and design in commercial applications. Knowledge of real-time, communications and database would be an advantage.

Excellent salary, opportunity and benefits.

Contact: Jim Baker

Senior Programmers

MORTGAGE SUBSIDY

up to £7,500 + many benefits

Hampshire

Our Hampshire client, undertaking advanced development work on a large real-time database system, now need to strengthen their team on this project with additional senior staff. The system is being built around a powerful Burroughs B6800 machine and incorporates a DMS 2 database with a multi terminal real-time network.

Candidates must be mature, senior individuals with several years programming experience on real-time and/or database development projects. Leadership qualities and a natural ability to readily conform to strict standards will be sought. Wonderful opportunity for career advancement and a truly magnificent employment package.

Contact: Mike Creamer

Analyst/Programmers

Thames Valley

negotiable to £7,000

Our Client, well-known and respected in the electronics field, are involved in new ventures in data processing, including the development of internal (commercial) systems for implementation and marketing outside the company. Two people are required to play a major role in those ventures. Specific hardware or language knowledge is not important, but a minimum of one years programming is necessary. For one position, a knowledge of Assembler (any) would be useful.

Excellent opportunity to join an established and growing company, where enthusiasm and hard work is rewarded.

Contact: Bernard Kiernan

Programmers

Berkshire

up to £7,000

A well established British company specialising in industrial systems has opportunities for Programmers to join the expanding development teams. Candidates preferably graduates with at least twelve months programming, should have experience of minicomputers in technical, industrial or process control applications.

Large company benefits including relocation.

Contact: Jim Baker

Nottingham

Systems Analysts

c. £6,300

A major and diverse company requires SYSTEMS ANALYSTS to assist in the development of a range of interesting commercial applications. In addition to systems experience applicants should have a good education and at least 2 years programming experience preferably in an IBM mainframe environment.

Contact: Bev Stevens

Operators - IBM Tech. Support

U.K. & Europe

Our client, a large U.S.A. software package development and marketing organisation, seeks informed and experienced IBM Operators who have the immediate potential for Technical Support Work. The work will involve being based in the U.K. or in Europe with considerable travel. Applicants must be able to prove in-depth knowledge of IBM systems software operation, preferably DOS, and have if possible Assembler programming ability.

Contact: Mike Creamer

JAMES BAKER ASSOCIATES
International Personnel Consultants
32 Savile Row, London W1
Tel: 01-439 9311



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Salaries to: £10,000 (UK) £18,000 (Europe)

MARCOL urgently require experienced programming staff to support new and existing projects both in Europe and the U.K.

If you have experience in any of the following:-

• On-Line (preferably MUMPS) for hotel systems development

• ICL 2900 VMEB/VMEK & ICL 1900 COBOL

• IBM 360/370 IMS, CICS

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If you have good relevant experience you too could join TASK FORCE. Our solution to staff shortage is to provide the best deal for freelancers and therefore provide the best support for our clients. With TASK FORCE you will work as part of a friendly professional team, we will give you more cash in your pocket, more work and more benefits. Contract or permanent, you have the option - this is how it works:

ON A CONTRACT BASIS

- We will pay you very competitive rates, give you regular work, training and security.
- If required we will set you up as a limited company. This gives you complete control of your tax payments and means you could pay much less.
- We will solve your administration headaches, your company set up, book-keeping, invoicing, accounts and tax returns will be done for you by professionals as a free service.
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Salary negotiable circa 10K + company car, training, security and all company benefits.

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OUR REPUTATION TELLS ALL

DATA PROCESSING MANAGER

SOUTHERN ELECTRICITY
Our clients, a leading American owned company, are seeking someone to be fully responsible for the EDP department. A least five years' experience together with a programming background of RPG/COBOL is required. A full relocation package is offered.
Ref. M3748

SHIFT LEADER

MIDDLESEX
Good experience in ODS/VS together with supervisory skills are essential. The company are installing their first computer, an IBM 4331, in late February/early March and initially will operate on a DAYS ONLY basis. Career progression will be rapid for the right applicant.
Ref. M3749

SENIOR OPERATOR

WEST LONDON
This position would ideally suit a senior operator who is seeking career advancement. Must be DEC with communications experience in required for PDP site.
Ref. M3751

SENIOR OPERATOR

EAST LONDON
This is an excellent opportunity for someone to join a small but growing company to take a lot of responsibility. The position would suit someone with medium computer operations background. Future prospects with the DAYS ONLY position are excellent. Company benefits include CHEAP MORTGAGE and BUPA.
Ref. M3688

SENIOR OPERATOR

WEST LONDON
This position would ideally suit someone with a DEC background. The successful applicant will have at least five years' ODS/VS POWER/VS experience. The site operates on a 24hr system.
Ref. M3752

SENIOR OPERATOR

HAMPSHIRE
A minimum of 2 years' ODS/VS and VME65 experience is required for this self-contained company. The position offers rapid promotion opportunities for the right person together with excellent benefits and full relocation package.
Ref. M3753

SENIOR OPERATOR

SURREY
Applicants should be at senior operator level with a minimum of 2 years' ICL 1900 or 2904 experience. They will gain a large and flexible benefit package operating a 24hr system.
Ref. M3754

OPERATOR

CENTRAL LONDON
A large banking group are seeking an operator with a minimum of 1 year ODS/VS POWER/VS experience. The site operates a 24hr system and offers the many attractive benefits offered at MORTGAGE FACILITIES and travel allowance.
Ref. M3755

OPERATOR

MIDDLESEX
A major ICL user is seeking applicants with ICL 1900 or 2900 VME65 experience to progress within a large expanding installation. This is an ideal opportunity for the right person.
Ref. M3756

CHIEF PROGRAMMER

SURREY
We have been asked to assist with the recruitment of a Chief Programmer who should have a minimum of 4 years' COBOL together with an alternative language, preferably on IBM (DOS). Must be able to implement structured programs and have supervisory skills.
Ref. M3757

ANALYST/PROGRAMMER

SOUTH LONDON
Applicants for this position should have a minimum of 2 years' design experience preferably gained within an ICL environment. A knowledge of COBOL/PLAN together with commercial design experience is required. Experience of DEC hardware would be an advantage.
Ref. M3463

ANALYST/PROGRAMMER

MIDDLESEX
Our clients are looking for a Chief Programmer on IBM 4331, in late February/early March and wish to recruit someone with a sound COBOL background. There will be ample scope for progression for those working at this new installation.
Ref. M3758

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COMPUTER RESEARCH CONSULTANTS
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Two PDP-11 operators with 3 years' experience are required immediately for an industrial client in North London. Salary £200 pw.
An ICL 2960 operator is required for a 24hr system (start February 26, Ref. M3759).
We urgently need a NEWLY qualified and experienced DAYS ONLY operator in London. Ref. M3760.
A DATA I/O operator is required for 2 months in a London based company. Ref. M3761.
ICL 32 Operators are required for a variety of North London companies. Ref. M3762.
We need all types of PUNCH, VDU and DOS Operators for various London and Home Counties jobs. Ref. M3763.
If you have 2 years' + operations experience, and are a freelance operator for industrial clients, contact us for full details of our current and forthcoming contracts. REMEMBER, we pay excellent rates and expenses to our operators.

Complete the coupon and return to Effectia Gravis, National House, 66 Wardour Street, London, W1V 3HP, for your next PERMANENT or CONTRACT job.

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Company: Name _____ From _____ To _____

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£250 pw. Midlands

Have you got VMEB/VMEK and GEORGE III DATABASE experience? Have you got MAXIMOP PACKAGE experience? Say yes twice and you're definitely a wanted person. There is a choice of teams to work with on ICL 2900 and 1900. This Company think you're worth so much they'll not only give you the pick of jobs, they'll give you the pick of the people to work with.

£250 Scotland

This really is a choice one. Up there with all the skiing and outdoor sports there's a Company desperate for you. At the moment their very friendly team is overworked and if you can work on ICL 1500 VTL/CDE then they'd very much like you to join them. We'll sort out any moving problems you might have.

Phone us now for details.

ICL 1500 CDE/VTL 3 mth + various £260 pw

IBM 370 PLI 3 mth Midlands £250 pw

ICL 2960 VMEB IDMS 3 mth

Yorkshire £250 pw

UNIVAC 9030 RPGII 6 mth

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Scientific Applications

12 mth North £250 pw

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£250 pw

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Business & Systems**£300 per week North West**

Here is a unique opportunity to work as Project Leader on a brand new installation. You'd be coming in at the start of a major growth in this particular company. There is responsibility and the rewards are appropriate. If you have experience of INTERACTIVE SYSTEMS DESIGN phone us now. A 4 month contract is being offered with an immediate start. This is your chance to get in at a top level.

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If ever you needed tempting to work Contract this is the one to do it. A multinational giant needs a SYSTEMS DESIGNER now. They need you for conversion and preparation for a large IBM 370/158 installation running under DOS/VS. If you have command level CLIS and COBOL experience you're the one for them. It's a massive corporate project. Get in at the start by phoning us now.

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This is a post that carries a lot of responsibility and so the money and the extras reflect that. You'd be using your experience on IBM 370/158 OS/VS 2 and COBOL, and working as a Senior Analyst Programmer on a 6 month contract. If you want that move up you've dreamed of, phone us now.

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A city concern using a major commercial system need you to work on IBM 370/148, DOS/VS COBOL, and ASSEMBLER. If you have TOTAL DATA BASE experience and On-Line CICS we've got a 3-6 month contract starting March to tempt you with. The money's good. The place is better (city-centre) and the people are even better still. Phone us now for details.

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Business Analyst ICL Hardware Exp. Mid. £270 pw

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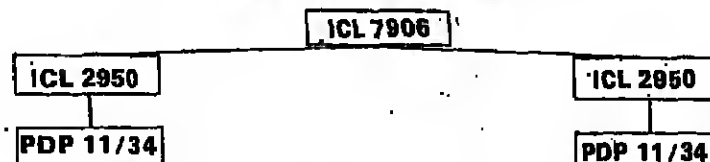
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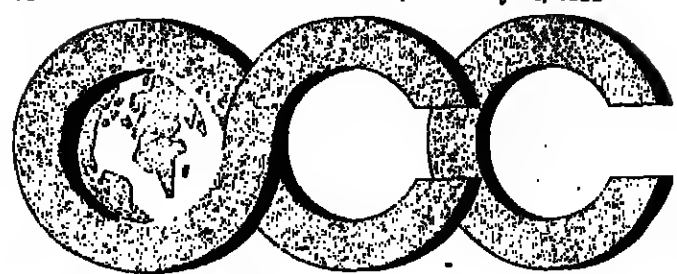
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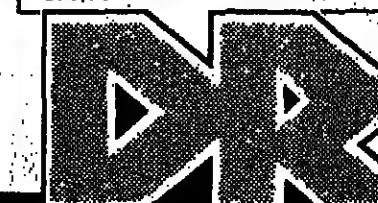
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COMPUTER WEEKLY CLASSIFIED

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people rely on

Every kind of work is available in the West

by Phil Gascoigne
and Rick Burgess

of Walker-Weston Executive
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AS we stand on the threshold of the 80s having slammed the door behind us on the 70s, some people may be forgiven for thinking that the West Country has been left on the wrong side of the decade.

This is largely misconceived and for those considering living and working in the area the situation is worth further study.

It is true that the general pace of life in the West Country is slower than many places, and it is equally true that most people here prefer it that way. Technology invades at a more leisurely speed and although DP has also taken time to get here (largely due to managerial reservations) it is now well and truly established in all areas, mainframe, mini and micro.

The major manufacturers are all well represented and the patriotic will be pleased that ICL has a definite majority with something approaching 50% of the market. Many of these are large installations, but there are also large numbers of small sites.

IBM holds approximately 25% of the market, but this is increasing, apparently to ICL's detriment, and again many small sites are being added to the stable base of large IBM installations.

The other mainframe users, notably Univac and Honeywell, share the remaining 25% of the market fairly equally with the growing mini influence in the area and here the market is led by Digital Equipment and Honeywell, although ICL's 1500 series is now moving in quickly.

Many of the minis are used in conjunction with large mainframes as front-ends for distributed processing networks as well as in the normal standalone applications.

This mini market has the largest potential of all and the 80s will no doubt see a massive increase in their use, especially at the small business end. This helps also to explain the growth in the number of software houses over the last two years or so, since they are obviously anticipating this upsurge in demand.

An increase in the activities of software houses normally predicts a market development, as small enterprising organisations respond quickly to an obvious need without the inertia and caution of larger businesses.

The micro market is also wide open and will expand rapidly although this is not likely to reflect in the job scene directly. Small businesses which buy micros will tend either to buy the manufacturer's software or else use the services of software houses again.

It remains to be seen what effect imports will have, but most experts appear to view this as a favourable development.

Having set the stage

regarding the general distribution of hardware we can now look at jobs and their availability.

As with the rest of the country, by far the greatest need is for systems and programming staff of all levels, with the bias predictably tending towards Cobol. PL/I is increasingly sought after and as the numbers of IBM System 34 users grow, so does the need for RPG2.

Again on the IBM front, APL will probably be in more demand (albeit at systems level initially) as more 4300s come into the West Country. Plan, although still used, is waning in popularity as in DP generally. Fortran is often required on both mainframes and minis, and the main mini languages are still Fortran and Assembler-type languages. Basic is also making its presence felt in a way which spells out a good future for people in this discipline.

Both programmers and analysts will find everything going for them. It is worth remembering that there are a lot of medium to small sites spread through the area, and as such, the sense behind combined analysis and programming expertise is generally accepted. The obvious implication is that, for programmers especially, the future is very bright since one can expect to gain analysis experience with many of these smaller installations.

At the more specialised end of the spectrum, people with database and data communications knowledge or experience in real time and online systems are as much in demand in Wales and the West as in the rest of the country. There are opportunities for management positions too, as much here as anywhere else, and bearing in mind the general expansion throughout the region, this can only increase.

There are also operations vacancies available, although to be fair they form a relatively small proportion when compared to the systems and programming opportunities. If you are already in the area, then often the local Press is likely to be the best avenue; otherwise the advice of a good recruitment agency would be the most reliable source of information.

In fact, every kind of work is available, in sufficient quantities and spread throughout the whole of the West Country and South Wales, making

important area for future DP expansion.

The continued development of technology and sophisticated software is making it possible for companies to reduce costs by relocating their DP sites, while maintaining their head office in London or the other major centres, and here RJE and distributed processing networks have become major lifelines.

So the trend continues. More and more companies are moving West, taking advantage of the relative cheapness of land, combined with superb communications facilities by both road and rail to all parts of the country.

For these same reasons, plus that elusive "quality of life" we try to define so inadequately, many people have found the West Country to be just what the doctor ordered. Clean air, beautiful countryside, less crowded roads and plenty of real ale all play their part in

the West Country lure. If you want real city-type night life then, of course, you have to go to one of the cities. Culture vultures will find that Bristol, Bath and Cheltenham are on the normal cultural circuit and there is no lack of live music entertainment available.

Housing is generally still cheaper than in most large centres, and there is a variety of different types and styles of property available. A visit to the local estate agent will soon establish your price range, and most people still find they can either improve their accommodation for the same price or else buy a similar property and pocket a useful if not sizeable profit.

All of this, combined with the opportunities within DP make the West Country or South Wales a very tempting proposition indeed. If you still have doubts, come and take a look — seeing is believing.

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Application forms may be obtained from the Director of Personnel, The Council House, College Green, Bristol BS1 5TN. Telephone Bristol (0272) 20031 extension 247 quoting ref: CU073.

Applications returnable by: 25 February, 1980

Bristol

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Are you interested in training personnel to be persons or programmers? Or would you like to lecture on more general Data Processing courses? If you have some spare time or can arrange some time off work or can make an exchange with a lecturer for perhaps one day a week, this could suit you.

Temporary full-time posts also available from 1st April and 1st September, 1980.

Contact: A. G. Pears or Ms. H. Dewhurst if you have a working knowledge of computers — teaching experience would be an advantage. Details (S.A.S.) from Principal, Filton Technical College, 51th BRISTOL BR72 7AT (Bristol 594217).

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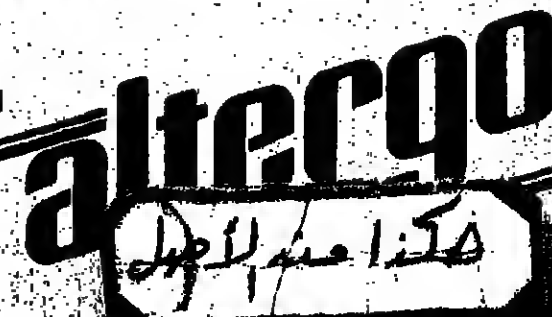
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IBM

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This role involves the design, development, testing, and maintenance of computer programs, together with an excellent negotiable starting salary.
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ANALYST/PROGRAMMER To £10,000
A manufacturing company based in the City require an Analyst/Programmer for their small OP Department. You will have at least 5 years' mainframe COBOL experience and be a self-motivated individual, capable of dealing with user demands. Benefits include season ticket loan, staff canteen.

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IBM RPG II PROGRAMMERS c£6500
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The company is looking for top-rate analysts with at least 4 years' experience in Data Processing with a minimum of 2 years in Systems Analysis. Experience in database development and on-line systems would be an advantage.

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Temporary full-time posts also available from 1st April and 1st September, 1980.
Contact: A. G. Pioro or Ms. H. Dawhurst if you have a working knowledge of computers - teaching experience would be an advantage. Outside (B.A.E.) from Principal, Pilton Technical College, Pilton, BRISTOL BS12 7AT (Bristol 594217).

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Mr. I. Brown, Computer Installation Manager, King's College Hospital Computer Installation, Denmark Hill, London SE5 8RS. Telephone No. 01-274 6222, Ext. 2574.
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Application forms are available from the Personnel Officer, Severn Trent Water Authority, Derwent Division, Raynesway, Derby DE2 7JA. Telephone: Derby (0332) 51481 Ext. 318/320.

Closing date:
February 15, 1980.
This post is open to both men and women.

SENIOR PROGRAMMER/ANALYST

Grade/Salary SO1/PO1(1) £2011-£7326 p.a.

Required to join a small team engaged upon the development and maintenance of management information, stock control and order processing systems in the Department of Building Design and Construction.

Applicants should be fluent in Fortran and Cobol and be qualified to MSc level.

Fringe benefits may include up to £900 legal fees incurred in house purchase, 75% removal expenses or a lodging allowance in approved cases.

Flexitime hours worked.

Application forms from Personnel Officer
quoting reference A/81/40
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LONDON BOROUGH OF HILLINGDON
Uxbridge, Middlesex
UB8 3PH
Telephone: Uxbridge 80999
Closing date: 28.2.80

RPG11 Programmer

Vitamealo nr. Bristol

Vitamealo is part of Beecham Animal Health and our business is the manufacture and marketing of animal feeds.

A new vacancy has arisen at our Keynsham base for an RPG 11 Programmer to join a small team developing new applications including stock control on an IBM system 34 following the transfer of the existing applications from an IBM system 32.

The successful candidate will have had at least 2 years' experience of RPG 11 and should preferably have worked on an IBM 34 system.

A competitive salary is offered and the other benefits are those associated with a large successful company.

This is a real opportunity for the right person to develop within a challenging environment. If you feel that you have the necessary qualities then write, giving brief but comprehensive information, to:

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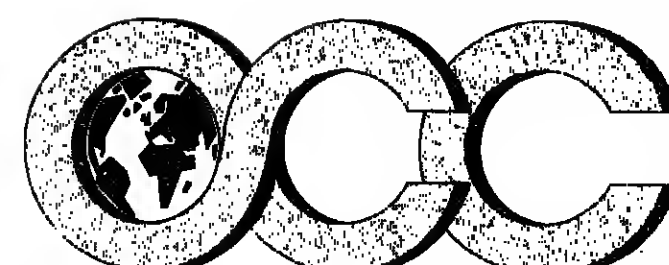
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required for the Central Computing Services. The duties of the Computer Operator include assisting with the operation of a CDC 6400 system 71 Computer and a CDC 6400 terminal, both connected to the University of London Computer Centre. Salary on scale £2542-£4446 (including Allowance).

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£5,721-£6,627 (pay award pending)

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The installation, under the control of the treasurer, is in ICL 1902T with BOK store and a communication system.

There is no standard application form and written applications should be forwarded to the Treasurer, County House, Handsworth Street, St. Helens, Merseyside, by 22nd February, 1980.

For further information please contact Mr. J. Barker - St. Helens (0744) 24081, Ext. 2305.

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Faversham, Kent. C. £8000

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Duties will include systems analysis work and applicants should be experienced in RPG programming. Previous experience in a manufacturing environment is desirable. Candidates under 25 are unlikely to have sufficient experience.

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- * 2 to 3 years sound experience in RPG II
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Experience Place no. of years in box, e.g. IBM 360/370 4

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Please specify model.
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Please state briefly the type of appointment you are seeking.

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These positions require a minimum of three years' systems and two years' programming experience in the area of Financial/Administrative applications ideally obtained in an IBM DOS COBOL environment and must have controlled at least one major project through to implementation.

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A minimum of 2 years' commercial IBM 370 DOS/VS COBOL experience is required and for Analyst programmers an additional one year of systems analysis and design.

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To lead a small team charged with ensuring good technical support for petroleum and other engineering users and for implementation of technical software packages, user assistance, advisory services, technical documentation and development of engineering data bases.

Applicants must have at least six years' computing experience gained in oil industry, engineering, or scientific environment, preferably using IBM 370 equipment. Experience in online computing, graphics, Mark IV would be desirable.

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Applicants must be experienced FORTRAN Programmers with Engineering or scientific background preferably in the oil industry to work closely with our engineers to implement and support engineering packages and data bases and provide advisory and documentation services. Expertise with Graphics, Mark IV, online computing, DOS/VS or micro based systems would be an advantage.

Applications, listing name, address, qualifications, experience to date, previous employers and positions held, present employer, salary, position and expected salary as well as any other relevant information should be sent to:-

Personnel and Training Manager, QGPC, P.O. Box 3212, Doha-Qatar, Arabian Gulf

All applications will be dealt with promptly and in strict confidence

SENIOR SYSTEMS PROGRAMMER

Applicants must have at least 5 years' IBM DOS/VS systems programming experience. CICS, POWER and LIBRARIAN experience is highly desirable.

Person appointed will be responsible for implementation support and maintenance of operating systems software.

OPERATIONS MANAGER

To be responsible for the management of computer operations including data preparation using key to disc equipment and for instituting operational standards and development of operations staff.

Applicants must have at least 3 years' operations management experience of IBM 370 equipment.

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The person appointed must have at least 5 years' DOS/VS experience and will be responsible for the day-to-day smooth and efficient operation of the machine and for maintaining high standards of operation.

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Candidates should have at least 3 years' DOS/VS POWER/VS experience for holding these responsible positions.

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The projects are:

Enquiry Systems
On-Line Transaction Handling
Archive Systems
Report Systems

No language problems are anticipated but, nevertheless, senior team members will be taught Dutch if necessary. Senior members will also be required to contract for a minimum period of one year.

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with INSTRUMENTATION or PROCESS CONTROL experience. Knowledge of RMX 80 multitasking operating system and/or ISIS II advantageous. Hardware INTEL 8080.

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To instigate a database structure and reporting system in an IBM 370/158 and 188 environment. A first-class knowledge of IMS Database batch processing for report listing and on-line processing for enquiry handling must be held.

Location: The Netherlands.

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to continue development of a distributed processing system and thus good previous experience of 3790 communications processing and macro assembler is essential.

Location: The Netherlands

IBM PROGRAMMER/ANALYSTS

to continue development of commercial systems for a multi-national distributed processing group. Familiarity with structured programming techniques and knowledge of IBM 370/138 hardware running under DOS/VS, POWER/GRASP. In a COBOL environment will be looked for, together with a minimum of two years experience. An upgrading to IBM 4300 Series is already in progress.

Location: The Netherlands.

RPG II PROGRAMMER

to support general commercial systems running on IBM System 34 hardware. These include order processing and financial systems and, although not mandatory, some knowledge of COBOL could well be advantageous. Again, good previous experience will be looking for.

Location: The Netherlands.

COMPUTER OPERATOR

for night-shift work on an IBM 370/138 running under DOS/VS and POWER/GRASP in an environment also using CICS, VTAM and SNA.

Location: The Netherlands.

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Interested applicants may contact Mr. K. Normington, Coventry (0203) 24166, Ext. 262, for informal discussions.

For application forms and job specifications apply in writing enclosing a large self-addressed envelope to the Personnel Officer, Coventry (Lanchester) Polytechnic, Priory Street, Coventry CV1 5FB, returnable within ten days of the appearance of the advertisement.

Sex Discrimination Act

No job advertisement which indicates or can reasonably be understood as indicating an intention to discriminate on grounds of sex (e.g. by inviting applications only from males or only from females) may be accepted unless:

- (1) the job is for the purpose of a private household or
- (2) it is in a business employing less than six persons or
- (3) it is otherwise excepted from the requirements of the Sex Discrimination Act.

A statement must be made at the time the advertisement is placed, saying which of the exceptions in the Act is considered to apply.

THE SALES BIT

Who fails when a job goes wrong?

At some stage most salesmen have to give close consideration to the career opportunities which might be available to them beyond their present role. Perhaps predictably, the aspirations of many sales people are directed towards sales management, marketing, general management or even establishing their own business.

For many this will be a stage in their career when they will have their first face-to-face introduction to personal failure. The reasons for a person failing to meet his or her job objectives (as opposed to responsibilities) can be many and varied. However, a constant in this often ignominious situation is the apparent belief at all levels of management that the failure of an individual to succeed in a specific job is the sole responsibility of the incumbent.

I recently had a visit from an ex-colleague who, while making an excellent job of hiding his justifiable confusion and distress, told me he had received a formal letter from his employer dispensing with his services after 10 years. I was shocked, too, because this man had worked for me with that same company and had enjoyed considerable success, particularly as a senior salesman, and was extremely well thought of among employees and clients alike. So what happened? Well, first he became an area sales manager where he did a reasonable job for a couple of years, then he moved into marketing (to which in my opinion he was totally unsuited) where he stayed for three years or so, then he was given a general management role within a branch office environment. I can only assume the company was dissatisfied with his performance in the latter job and consequently decided to fire him.

I don't intend to discuss the ethics of such an action. However, a man who has enjoyed significant success for a considerable proportion of his service should perhaps be entitled to something better than a "Dear John".

The point I wish to take up is: Who really fails when someone gets a job wrong? One's basic inclination is to limit the blame to the incompetence of the individual involved. This is only part, or indeed one side, of the story. It is the responsibility of management to select the right person for the job and utilise whatever means are available to ensure success. There are lots of aids available for this process, from psychological analysis to the use of well-informed third parties.

Unfortunately, the standard of selection for management jobs is generally inadequate throughout British industry and commerce and consequently candidates are chosen on an instinctive and often irrational basis. "Don't make your best salesman into a manager".

I can assure you they will have no idea.

TRADER

Trader welcomes comments on his column and is happy to consider readers' problems in marketing and selling.

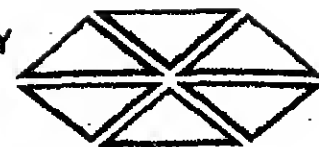
Puzzle Answer

It will obviously have to be a, which means that I is virtually certain to be 'O'. Then, examination of the third column from the left leads quickly to E, = x (the extra digit).

That's a fine start, and good encouragement for the hard work that still lies ahead. The final sum is in fact:

5 8 3 x 7 6 9 8 2
—————
4 0 2 4 x 9
with a carry of 7, interchange-able.

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Applications are invited, therefore, for the following posts:

COMPUTER OPERATOR
Applicants should be experienced in the operation of ICL equipment, which is to be used in a batch of time-sharing service.

The salary will be in accordance with the NJC Conditions of Service, Scale T2 — £3655-£3995.

DATA PREPARATION OPERATOR
Applicants should be experienced in data preparation work, mainly with punched card equipment.

The salary will be in accordance with the NJC Conditions of Service, Machine Operator (Intermittent) Scale — £1892-£3185.

Application forms and further particulars are available from Staffing Officer, Stratford College, Great Horton Road, Stratford SO7 1AY.

And completed forms should be returned so as to reach him not later than 27 February, 1980.

Stratford College

UNIVERSITY OF GLASGOW
DEPARTMENT OF COMMUNITY MEDICINE

STATISTICAL APPLICATIONS PROGRAMMER

Applications are invited for the above post in the Department of Community Medicine, Ruchill Hospital, Glasgow.

The department is involved in long-term projects which give rise to large, and sometimes complex, sets of data. Particular interests of the department include the monitoring of disease, evaluation of health programmes and evaluation of health in particular occupational groups. There is also a long-term interest in the application of statistical inference and decision theory to clinical medicine which has given rise to a number of projects. The management of these data sets and their analysis — either by program packages or by ad hoc programs — is the main responsibility of this post. The successful applicant would be expected to teach elementary principles of computing to medical undergraduates and postgraduate students, and to assist in collaborative projects as they arise.

Some experience in survey design, data handling and in applied statistics is essential, as is a wide experience in programming. The successful applicant will be encouraged to initiate ideas and follow them through in publications.

Further information may be obtained from Professor G. T. Stewart, University Department of Community Medicine, Ruchill Hospital, Glasgow G20 8NB, (041 846 7120, Ext. 276).

Applications (3 copies), with the names and addresses of three referees, should be lodged with the Secretary of the University Court (Room 18), University of Glasgow, Glasgow G12 8QQ, on or before 14th March, 1980.

In reply please quote Ref. No. 4691P.

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Any hardware and software experience acceptable except where stated otherwise. Main language COBOL, Applications commercial and manufacturing.

INFORMAL INTERVIEWS

GREENOCK	GLASGOW	GLASGOW
Monday 18 February 1980	Tuesday 19 February 1980	Wed. 20 February 1980
Tontine Hotel	North British Hotel	North British Hotel
6 Ardgowan Square	40 George Square	40 George Square
0475-23316	041-332-6711	041-332-6711
4.00 p.m. - 8.00 p.m.	10.00 a.m. - 8.00 p.m.	10.00 a.m. - 8.00 p.m.

No appointment is necessary - just call in between the times shown and ask for our consultants. If you cannot make it on these days, please telephone us at the hotels or any of our offices and leave your name, address and telephone numbers and we will contact you to arrange a confidential discussion.

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